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HENRY MILTON WHELPLEY.

The news of the death of Past-President Henry M. Whelpley came as a shock and it is even now difficult to realize we shall see and hear him no more at the annual meetings of the AMERICAN PHARMACEUTICAL ASSOCIATION. For a number of years our deceased member spoke with due appreciation and regard of those who had ceased their labors, now others will speak of him. His memories of the companions of other years, their traits and qualities were always expressed in kindly words, and kept those who heard him in touch with those who had gone before. His lectures entertained and instructed his hearers.

Dr. Whelpley always had more invitations for his illustrated lectures on subjects related to pharmacy, on Indian life and lore and its connection with other activities, than he could accept. His collection of Indian flint, stone and hematite implements is known to all students of American archaeology; there are no private collections that approximate his in number, variety and finish. The slides, most of them colored by Mrs. Whelpley, number about 1000; these do not include the slides for his ASSOCIATION lectures. Dr. G. R. Throop, Assistant to the Chancellor of Washington University, said—"Archaeologists from everywhere came to study his American Indian and Mound Builders' relics." He was for more than a decade Vice-President of the St. Louis Society of the Archaeological Institute of America; served as President of the St. Louis Anthropological Society, as President of the St. Louis Academy of Science, and as a member of the Board of Control of the Missouri Historical Society, and was to assume the presidency of the latter on July 1.

Dr. Whelpley was a member of the International Jury of Award of the Louisiana Purchase Exposition, in 1904, for which service he was awarded a medal and diploma by the latter, and the Philippine Insular Government conferred upon him a medal and diploma for service in behalf of its exhibit at the Louisiana Purchase Exposition.

Quoting "Who's Who" of 1910–1911.—"Henry Milton Whelpley was born

at Harmonia (near Battle Creek) Michigan, May 24, 1861; son of Jerome Twining (M. D.) and Charlotte (Chase) Whelpley. He was educated in Illinois and Michigan; graduated from St. Louis College of Pharmacy in 1883; from Missouri Medical College in 1890; from St. Louis Post Graduate School of Medicine in 1894; married Laura E. Spannagel, of St. Louis, 1892. Professor of Microscopy since 1884, and Dean of St. Louis College of Pharmacy since 1904; Lecturer on Materia Medica and Pharmacy 1886–1890. Professor of Physiology, Histology and Microscopy, Director of Biological Laboratory and Secretary of Missouri Medical College and St. Louis Post-Graduate School of Medicine; Professor of Materia Medica and Pharmacy, Medical Department of Washington University, since 1890; same at Missouri Dental College 1900–1903."

In a comprehensive sketch by Dr. James H. Beal, of Dr. H. M. Whelpley, in JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION for December 1921, pp. 921–923, the memberships in societies, associations and clubs are given—not so far from fifty; in a number of these the deceased, at different periods, held office and he was not inclined to hold membership in organizations in which he did not take an active part. It was his systematic way of doing things that enabled him to share in so many activities.

His work in the AMERICAN PHARMACEUTICAL ASSOCIATION is part of the ASSOCIATION'S record; twenty or more titles of papers will be found in the Index of the PROCEEDINGS, and each volume of the JOURNAL speaks of his contributions to and participation in the proceedings of the ASSOCIATION; he became a member in 1887 and was elected Secretary of the section on Pharmaceutical Legislation; in 1888 he served as Secretary of the Scientific Section, in 1889 as its Chairman; in 1893, he served as General Secretary for the late John M. Maisch; from 1902–1908 he was Secretary of the Council; in 1908, he was elected Treasurer and served until 1921; elected President in 1901, he presided over the Golden Anniversary meeting in Philadelphia and presented a most interesting historical address. He was a member of the Council at the time of his demise, and held an unbroken record of membership.

The 1925 Remington Honor Medal was awarded to Dr. Whelpley; in his address of acceptance he recalled interesting events of the years during which he had been member of the ASSOCIATION and spoke feelingly of his associates. He took a deep interest in the Headquarters project; in 1913 he read a paper before St. Louis Branch A. PH. A. on "The Proposed A. PH. A. Home." He aided largely in the organization and promotion of the House of Delegates.

In 1905–1906 he served as President of the American Conference of Pharmaceutical Faculties, and was active in the organization of the National Association of Boards of Pharmacy. By his death a vacancy is created in the Board of Trustees of the U. S. P. Convention, of which he was Secretary since 1900.

Mrs. Whelpley accompanied her husband to the ASSOCIATION meetings and is about as closely associated with the annual events as her lamented husband—the sympathy of the membership goes out to her in her sorrow, with a prayer that she may have strength to bear her great bereavement, in which the ASSOCIATION shares and many of its members feel the loss of a friend, teacher and co-worker. President L. L. Walton states in a letter, "I am much pained to learn of the death of Ex-President Whelpley. I feel that the AMERICAN PHARMACEUTICAL ASSO-

CIATION has suffered the loss of one of its most devoted and valued members. I should like to have everything done according to the proprieties and show the esteem in which he was held by the ASSOCIATION."

Dr. James H. Beal, one of the intimate friends of the deceased, spoke of him as follows, when he, on behalf of the AMERICAN PHARMACEUTICAL ASSOCIATION, presented Dr. and Mrs. Whelpley with a chest of silver and a watch as an expression of love and appreciation when the former retired from his office as treasurer of the AMERICAN PHARMACEUTICAL ASSOCIATION: "My friends, I have known Dr. Whelpley under many and various circumstances; in fair weather and in foul; in summer's heat and winter's cold. I have traveled with him many thousands of miles by land and water. I have slept with him under a tent and under the open sky. I have known him under all sorts of conditions and if he has within himself a vein of self-seeking or has ever done anything intended to advance his own interests in preference to those of the ASSOCIATION, it has been so perfectly concealed that I have never been able to discover it."

Ex-Treasurer Whelpley, in his response, stated it would require a volume to review his experiences which have interested him. He said, "I find as an outstanding feature an increased faith in human nature. I have not only learned to love my fellow-men better but to have more faith in the endeavor of every individual to do what is best in this ASSOCIATION."

The foregoing quotations will serve as the closing words of this sketch, to which, doubtless, other members of the ASSOCIATION will in conversation or writing add their appreciation.

The following closing record is made:

Dr. Whelpley attended the recent meeting of the Missouri Pharmaceutical Association in Kansas City, at which time he gave an historical review. He was for more than a quarter of a century Secretary of the Association, for some years historian, and elected *First Vice-President* at the recent meeting.

He became ill at the convention, suffering from acute indigestion, and died June 26, at the home of Mrs. J. P. Quinn, at Argentine, Kansas (near Kansas City), where Mr. and Mrs. Whelpley were guests during the meeting. Besides the widow, two sisters, Miss Cecilia Whelpley and Mrs. E. J. Lijegren, and two brothers Wilbur and Warren Whelpley, survive.

The funeral services were held at Wagoner's Chapel, St. Louis, June 29, at 2.00 P.M. President L. L. Walton appointed the following members a committee to represent the AMERICAN PHARMACEUTICAL ASSOCIATION: Carl F. G. Meyer, Charles E. Caspari, Charles Gietner, of St. Louis, William Mittelbach, Booneville, Mo. and D. V. Whitney, Kansas City. Chairman of the Council and Treasurer of the U. S. Pharmacopœial Convention Samuel Hilton and wife, Ex-President James H. Beal came from Florida to attend the funeral services, Secretary H. C. Christensen represented the National Association of Boards of Pharmacy, and many were in attendance from adjoining states to pay honor with citizens and members in Missouri to their friend and co-worker.—E. G. E.

EDITOR'S NOTE: Tributes to the memory of the deceased have been received in the JOURNAL office and others who wish to contribute are invited to do so; a symposium of these brief expressions will be published in the August number.

EDITORIAL

E. G. EBERLE, EDITOR 10 West Chase St., BALTIMORE, MD.

THE LIBERTY BELL IS THE SPIRITUAL HEART OF THE SESQUICENTENNIAL.

THE *Philadelphia Evening Ledger* of a few weeks ago had a most interesting editorial under a caption the substance of which is embodied in the above. The historic symbol is revered by visitors to this country as well as by us. Li Hung Chang, when standing before the Liberty Bell the first time, has been represented as saying to himself:

"I could not hear the voice in my ears;
But in my heart its tones took hold,"

and so it is that there is a procession of visitors almost daily, and at the present time the lines of patriots are long. Many eyes are dimmed, many a heart swells with pride and patriotism during these visits to the "Shrine of Liberty." It may well be questioned whether any nation preserves a relic of so great historic significance, one that speaks so clearly the language of freedom and proclaims its message so soul-stirringly.

Whatever we may see at the Exposition, and this will be a comprehensive, artistic, dignified exposition, the commemorative thought is after all uppermost. Every citizen loves dearly the emblem spoken of and the celebration in Philadelphia offers the opportunity of seeing it or standing by it again, as the case may be. Though silent, it proclaims a message sounding loud throughout the world.

It may be said that men of all lines of activities visit the resting place of Benjamin Franklin, because he was not only a pioneer but the things he promoted were of great value to the people of his country, of the world. He appealed to all because whatever he did had a wide application. He was not only patriotic and loyal, but he possessed the scientific interest and professional spirit. No one of his period was more highly esteemed and regarded and to-day he is accepted by many as the greatest of our citizens—the qualities mentioned contributed thereto—his activities were many-sided; he studied problems for their general worth and value and then interpreted their meaning, importance and service to the public.

The connection of the Libery Bell with Pharmacy may not be close but application can be made without shocking the feelings of our readers, for Pharmacy has a mission of service and it is that which will have a clearer meaning and tone at the Philadelphia meeting, if we listen to the intonations of service for Pharmacy and rightly interpret its meaning to the public.—E. G. E.

ADDITION TO SPECIAL NOTICES, NATIONAL FORMULARY V, PAGE XLI, BY AUTHORITY OF THE NATIONAL FORMULARY COMMITTEE.

Vegetable Drugs.—The official definitions and standards for vegetable drugs apply to all forms in which they may enter commerce, whether whole, cut, ground, powdered, or otherwise prepared for use, unless specifically exempted in the monograph or admitted under authority for manufacturing or for a special purpose.

Vegetable drugs are to be as free as practicable from insects or other animal life, animal material or animal excreta. They are to be free from moldiness and show no discoloration, abnormal odor, sliminess, or deterioration due to any cause.

For the preservation of vegetable or animal substances from the ravages of insects, it is directed in special cases that they be preserved in tightly closed containers with a few drops of chloroform or carbon tetrachloride added. It is not intended that this precaution should be obligatory for drugs in bales or large original containers where it may be impracticable.

The following drugs are particularly liable to the attack of insects: Angelicæ Radix, Anisum, Arnica, Avena Sativa, Bryonia, Coriandrum, Crocus, Fœniculum, Ficus, Humulus, Inula, Iris, Juniperus, Lappa, Matricaria, Myristica, Pinus Alba, Prunum, Rhamnus Cathartica, Rumex, Sabal, Stillingia and Taraxacum.

In commerce it is not possible to obtain vegetable drugs in a state of absolute purity, and a limited amount of innocuous, extraneous, or foreign matter adhering to the drug or admixed with it is usually not detrimental. The presence or admixture of any poisonous or dangerous foreign substance, however, is not permissible. Foreign organic matter refers to any part of the plant or plants yielding the drug, except that part or those parts designated as constituting the drug, and to any other plant parts, vegetable tissues, or substances.

In order that vegetable drugs be of a uniform quality and as free as practicable from foreign substances, it is required that in each vegetable drug recognized in this National Formulary the amount of foreign inorganic matter, estimated as acid-insoluble ash, be not more than 2 per cent of the weight of the drug unless otherwise specified in the monograph of the drug, and that the amount of foreign organic matter be restricted to the allowable percentage specified in the monograph of the drug. Before vegetable drugs are ground or powdered, all lumps of dirt or other foreign inorganic matter which can be separated by mechanical means should be removed.

[This matter came too late for inclusion in the first printing of National Formulary V, and is printed here for your information. If you have purchased a copy of the first issues of N. F. V, you may secure a loose leaf of these "Additions to Special Notes," gratis, by writing to the Chemical Catalog Company, 19 E. 24th St., New York City.]

THE PROCTER MEMORIAL AND THE MUSEUM OF THE A. PH. A. HEADQUARTERS.

AFTER rendering his report at the recent meeting of the Maryland Pharmaceutical Association, Chairman James E. Hancock of the Procter Memorial spoke, in substance, as follows:

"It might be well to explain that part of the report which says—'It has been the policy of the Committee on the William Procter, Jr. Memorial Fund to wait for more definite plans of the AMERICAN PHARMACEUTICAL ASSOCIATION Headquarters Building Committee, rather than attempt something that might be regretted in the near future.'

"Some time ago I gathered together certain materials with the idea that one of the features of the proposed AMERICAN PHARMACEUTICAL ASSOCIATION Headquarters Building will include a museum on Pharmacy. My hopes are that this

will not be a repository of useless things, but one of matters historically connected with the advancement of pharmacy that will educate the coming pharmacists to the economic aspects of pharmacy and its important place in the needs of the world.

"One of the books in my father's collection is a copy of the 'Pharmacopœia Lugdensis,' upon the fly leaf of which he had written the 'Father of all Pharmacopœias.' The study of this volume was most interesting with its arrangement for galenicals into Aromatics, Cerates, Confections, Electuaries, Opiates, Pills, Plasters, Salves, Syrups, Troches, etc.

"This 'Dispensatorium,' compiled by Valerius Cordus, a most precocious young man, who was born in 1515 and died in 1544, is a formulary of receipts by Greek, Roman, and Arabian physicians, such as Dioscorides, Galen, Andromachus, Rhazes, Avicenna and Nicolaus Præpositus (Salernitanus) and is a surprising effort of one who died at the early age of 29. Having been legalized by the High Council of Nuremberg and adopted by many other cities of Europe as a standard for pharmaceutical procedure, I was struck by its recommendations for substitutes such as Pellitory for Ginger, Castor Beans for Colocynth, Castor for Storax, etc., and in following out the query by collateral reading, I have become satisfied that the needs of the pharmacists largely stimulated the discovery of America. Some may think that this assumption is forced, but let us get the proper background of Europe and European trade at the time and remember that the Church had frowned on the practice of medicine for several centuries in its encouragement of cure by miracles, very much like the Christian Scientists would do now. Don't think of the fancied pictures of Medieval Courts or the apparent luxury of Kings and Nobles, but think of the average man of Central and Western Europe at that period, insufficiently clad with wooden sandals on his unstockinged feet and hard put to provide even the necessities of life.

"Those who returned from the Crusades brought back some idea of a better civilization. They had become acquainted with silks, precious stones, drugs, dyes, and spices. Take note of these five items and remember that precious stones were frequently used in medicines at that period and you will see that four out of these five were identified with the drug trade. The commerce for these made practically the first shops of Western Europe and they were brought by caravan from China, Japan, India and Persia to the Mediterranean ports from which they were distributed by Venetian and Genoese traders. And then largely as reprisals against the cruelty and the looting of the Christians during the several centuries of the Crusades, the people of Asia Minor developed a greater strength that culminated in the rise of the Ottoman Turk, who captured Constantinople in 1453 and cut off these caravan routes from the East. For more than 100 years following, the Turk or the Saracen controlled the Mediterranean and drove the European ships from that sea. As some one has expressed it, it is a question whether the Europeans voluntarily crossed the Atlantic or were pushed across. In any event, it was the need for these materials that had become the important interests of European commerce, and while it may sound more romantic to speak of these expeditions being financed by Kings and Queens, the real incentive was new trade routes to the East and all of these early adventurers were financed by merchants and, as you will see, largely in the search of materials needed by the Apothecary.

"Supplementing these records of the development of pharmacy, I am sure that an interesting exhibit of the early American appliances and models can still be obtained for such a museum. The proposed statue of Procter as the 'Father of American Pharmacy' could be made the dominating feature of such a museum, or it could be erected on a plot in front of the proposed Building and thus increase public interest in the Headquarters Building for American Pharmacy. Or should a mezzanine rotunda be provided at the entrance of the building with Procter's statue in the centre and the walls lined with portraits of those men who had devoted their lives to the promotion of pharmaceutical interests, it might be more acceptable. These might include the portraits of the Ex-Presidents of the AMERICAN PHARMACEUTICAL ASSOCIATION, for instance, in which event I would be glad to donate the portrait of John F. Hancock.

"The Committee on the AMERICAN PHARMACEUTICAL ASSOCIATION Headquarters Building will understand that no one wishes to interfere in any way with their duties. The members of the Committee are competent; their plans will need building stones, however, and if we have offered anything worth while in the way of suggestions, we hope that they, as its architects, will use what they see fit. Also I am personally interested in devising a memorial to my father, who initiated the Procter Memorial Fund and who was always sincere in his efforts for the advancement of American Pharmacy."

MERCUROCHROME AS A HISTOLOGICAL STAIN.

BY PAUL DAVID CARPENTER AND E. N. GATHERCOAL.

Mercurochrome can be used as a stain for histological material. Starch in particular takes the dye very readily assuming a light red color after treatment for one minute with a one per cent solution of mercurochrome in water. The stratifications are displayed clearly and the hilum is especially well defined. One striking advantage of this stain for starch is the fact that the color is not removed from the starch even after prolonged washing with alcohol, oil of cloves or water, hence botanical sections containing starch and stained with this dye can be thoroughly dehydrated without loss of color. Maranta starch stained with mercurochrome was washed with water for 96 hours and retained the red color. Starch so stained, dehydrated and mounted in balsam makes an excellent study. As a cytological stain it colors the protoplasm a bright red but is not good for differentiating the nucleus. It has the same advantages as with starch in that the color is not removed by washing with alcohol, water or oil of cloves.

In very dilute aqueous solution it rapidly stains the cilia of protozoa even while the organism is yet alive. Cellulose, suberized and lignified walls readily stain, taking a red color. The color is not lost by washing with alcohol, water or oil of cloves but rather improved by prolonged immersion in oil of cloves. It can, however, be covered with other dyes.

In the use of mercurochrome for double staining care should be exercised to avoid the use of acid dyes. It is very sensitive to acid, the mercurochrome being converted by even very dilute acids to a yellow resinous substance. Objects stained with mercurochrome change to a light yellow color when treated with an acid.

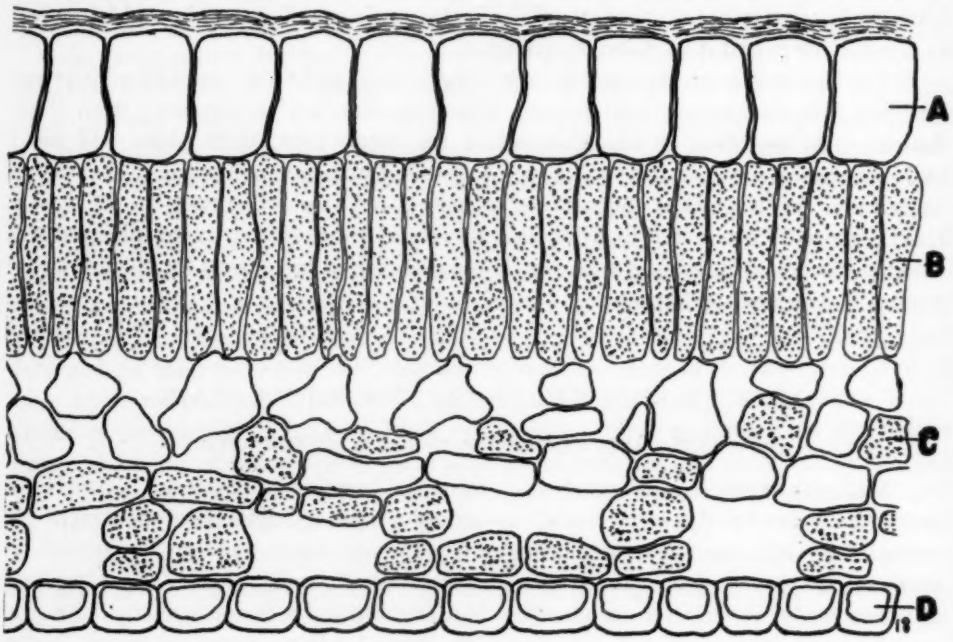
SCIENTIFIC SECTION

STRUCTURAL VARIATIONS IN ERYTHROXYLON LEAVES.

BY C. W. BALLARD.

(*Continued from p. 453, June* JOUR. A. PH. A.)

Erythroxylon brevipes, DC.—(Plate XVII.) This leaf averages 210 microns in thickness. The upper epidermis is very thick and consists of a single layer of nearly square cells with convex inner walls and extremely thick cutinized outer walls. The lower epidermis is comparatively thin, the free surfaces of the cells being convex; this formation is perhaps the forerunner of papillae. The convexity



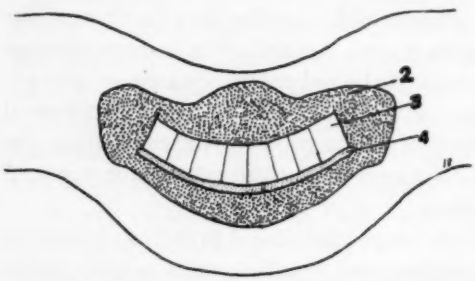


Plate XVIII.—*Erythroxylon Urbanii*, O. E. Schulz.

Upper—Leaf Section: A, upper epidermis; B, palisade; C, mesophyll parenchyma; D, lower epidermis.

Lower—Midvein Section: 2, fibers; 3, ducts; 4, sieve.

shows a slight increase in wall thickness over the other portions of the cell wall and this strengthens the view that these free surfaces represent rudimentary papillae. The palisade cells are dark brown in color and in several instances are divided transversely so that this region may be in one or two layers in thickness. These cells vary in size to meet the convex inner walls of the epidermal cells. The number of cells abutting on an epidermal cell is three or four. Mesophyll paren-

chyma consists of five to seven layers of isodiametric and flattened cells containing brown coloring material or chloroplasts. Prismatic calcium oxalate occurs abundantly within the cells of this region. The lower layers of parenchyma often show branching form, appearing in the section as circular cells.

Primary veins are deeply embedded in the mesophyll parenchyma and the amount of fibrous tissue in connection with them is so small as to cause but little displacement of the surrounding tissues.

Instead of a ridge on the upper leaf surface over the midvein, this specimen shows a slight depression or notch in this region. In general the tissues of the midvein are much reduced, with collenchyma practically absent. The lower surface of the vein consists of one or two layers of fibrous tissue within which occurs a narrow sieve zone. The sieve in turn is separated from the ducts by another layer of fibers, and a third layer of fibers is located on the upper surface of the ducts. This arrangement of layers of fibrous tissue alternating with sieve and duct zones is met with only in this specimen.

Erythroxylon Urbanii, O. E. Schulz.—(Plate XVIII.) Leaves of this specimen average 295 microns in thickness. The upper epidermis comprises about one-

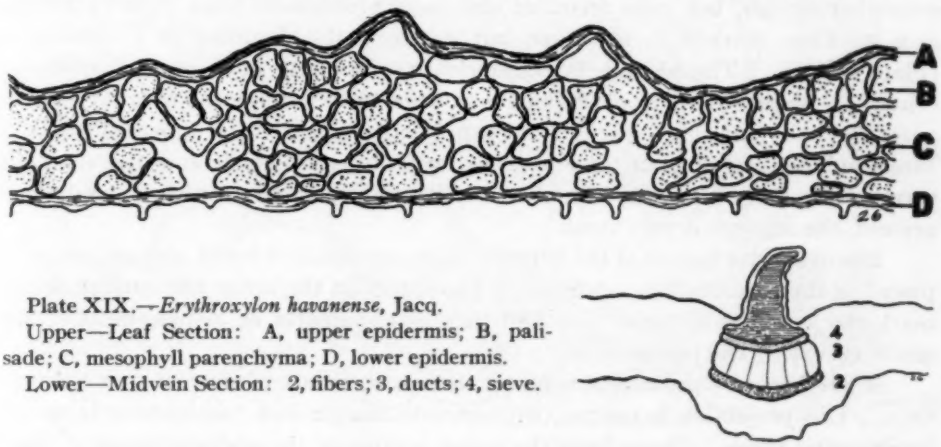


Plate XIX.—*Erythroxylon havanense*, Jacq.
Upper—Leaf Section: A, upper epidermis; B, palisade; C, mesophyll parenchyma; D, lower epidermis.
Lower—Midvein Section: 2, fibers; 3, ducts; 4, sieve.

fourth the total thickness of the leaf and consists of a single layer of radially elongated rectangular cells, the outer walls of which are heavily cutinized. This cuticle is thicker than in any of the other species examined and these cells are but slightly longer in a radial plane than broad. These epidermal cells are very regular in form and at least one of the leaves showed a white band between the inner wall of the epidermal layer and the palisade tissue, suggesting the possibility of a heavy cutinization of the inner as well as the outer walls. The side walls of these cells are thin and slightly wavy. The lower epidermis is devoid of papillae, the cells being rather thick-walled, especially on the sides and free surface. The palisade cells are brown, regular in form and five to six times longer than broad. Two or three cells abut on each epidermal cell. The mesophyll parenchyma consists of four to six layers of irregular and flattened cells, the latter often arranged in bands extending for considerable distance in the mesophyll. The collecting cells underlying the palisade are especially prominent. Many of the mesophyll cells are filled with a brown content. Large aerating chambers occur in this region. The cells

of this zone may assume branched form and prismatic calcium oxalate is present.

The primary veins are provided with very thick layers of fibrous tissue on both sides and this tissue entirely displaces the palisade at the points of occurrence. These fibrous tissues do not extend to the lower epidermis, being separated from the latter by at least two layers of parenchyma.

No ridge occurs on the upper surface of the leaf in the midvein region and there is no apparent thickening of the lamina at this point. However, the upper surface of the leaf is slightly depressed over the midvein and the lower surface shows a corresponding elevation. Pericyclic fibers encircle the vascular elements and are thickest on the upper surface just below the midpoint of the depressed area. Collenchyma does not occur in this region.

Erythroxylon havanense, Jacq.—(Plate XIX.) Sections of this leaf are not at all uniform in thickness as both upper and lower surfaces show large elevations or ridges. Thus different parts of the same section range in thickness from 150 to 285 microns. Accurate details of the upper and lower epidermal layers are almost impossible of determination, as these parts appear as a rather thick cuticle with but little signs of cellular structure. The lower epidermis shows peglike projections somewhat similar, but more frequent and more pronounced than those occurring in a specimen marked *E. obovatum*, but subsequently identified as *E. areolatum* (Plate XXIII). The palisade is extremely irregular both in size and disposition, containing scattered chloroplasts and is at some points subjacent to what are apparently epidermal cells, especially in the projecting ridges of the upper leaf surface. Mesophyll consists of from three to seven layers of isodiametric and irregular cells surrounding large aerating chambers. Although prismatic calcium oxalate is present, the amount is very small.

Fibrovascular tissues of the primary veins are much reduced and are centrally placed in the mesophyll parenchyma. The ridges on the upper leaf surface do not mark the locations of these veins and there is apparently no displacement of any tissue excepting the parenchyma.

There is a very prominent ridge on the upper surface of the leaf over the midvein. This projection is narrow, with crenate margin and the interior is of collenchymatic tissue. Ducts form the major portion of the midvein bundle. Sieve is a narrow and indistinct zone on the upper side of the ducts. Fibers are almost lacking, being reduced to a narrow band on the lower side of the duct region.

Erythroxylon minutifolium, Griseb.—(Plate XX.) This leaf is the thickest of all the species investigated in this work and averages 350 microns. Sections were cut with great difficulty, as they showed a tendency to disintegrate. The upper epidermis consists of nearly square cells the outer surfaces of which are covered by a thick cuticle, the inner surface showing a corresponding thickening but in lesser degree. Thus the palisade is separated from the epidermis by a light colored layer. The lower epidermal cells are about one-third the size of those of the upper epidermis, with thickened outer and side walls. Papillae are absent. Palisade consists of a single layer of extremely long and rather irregular cells of brown color. These cells are six to eight times longer than broad. Two or three palisade cells underlie each epidermal cell. Mesophyll parenchyma forms about one-half the total thickness of the section, the cells being of isodiametric and branched types and arranged in five to seven layers. Those cells adjoining the lower epidermis are apt to be

flattened and show thickened walls. Brown contents are present in a great number of these cells and the aerating spaces are large. Branched fibrous elements ramify in this portion of the leaf and prismatic calcium oxalate is present.

Primary veins are located more toward the lower leaf surface and the fibrous zones occurring in connection with these veins do not penetrate the palisade layer.

Instead of a ridge or crest appearing over the midvein on the upper leaf surface there is a slight indentation at this point. The midvein is deeply embedded

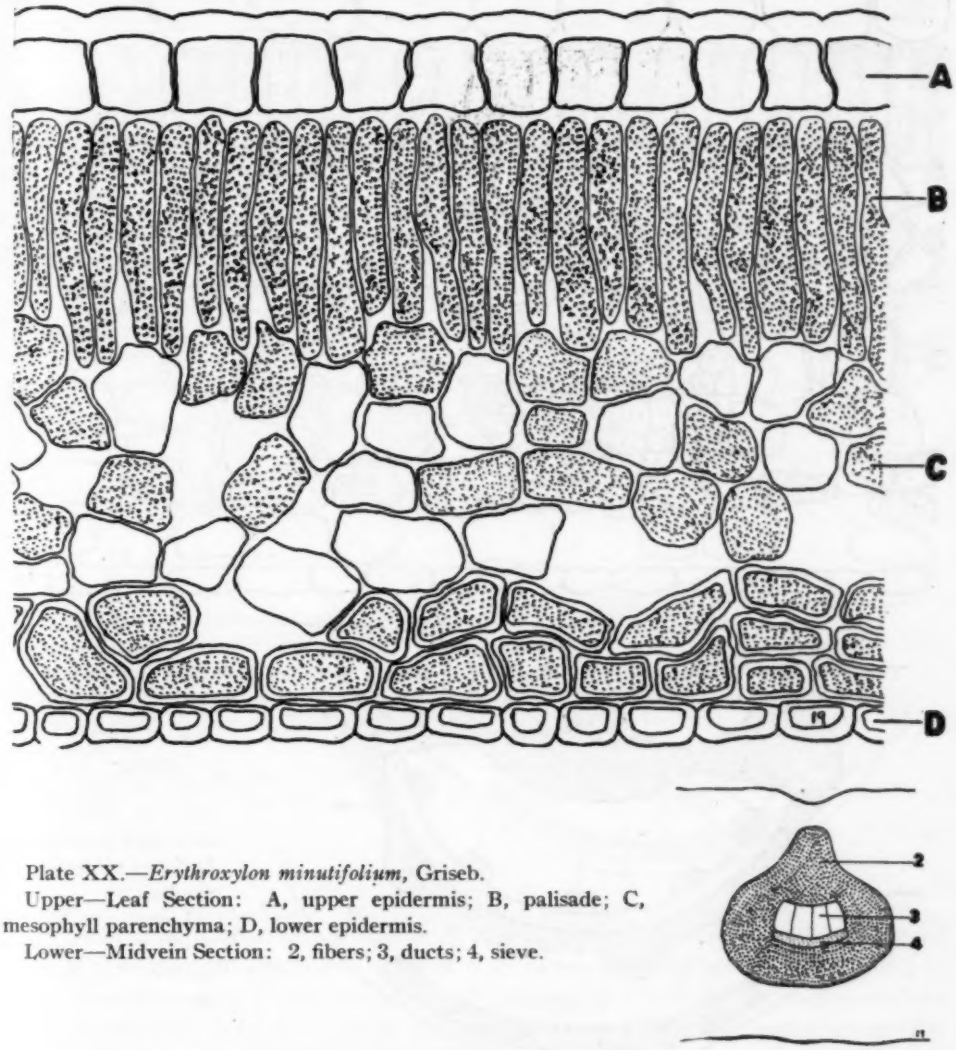


Plate XX.—*Erythroxylon minutifolium*, Griseb.
Upper—Leaf Section: A, upper epidermis; B, palisade; C, mesophyll parenchyma; D, lower epidermis.
Lower—Midvein Section: 2, fibers; 3, ducts; 4, sieve.

in the mesophyll and the vascular tissues are surrounded by a very thick layer of fibers. Ducts and sieve are much reduced and occur in the center of a mass of fibers.

Erythroxylon alaternifolium, A. Rich.—(Plate XXI.) Sections of this leaf average 315 microns in thickness. The upper epidermis consists of a single layer of large square cells, the outer walls being strongly cutinized. The lower epidermis

is comparatively thin and devoid of papillae. Palisade is represented by a single layer of fairly regular cells as regards size and arrangement. These cells are filled with a brown content, are four to five times longer than broad and two to three are in contact with each epidermal cell. Mesophyll parenchyma is six to eight layers

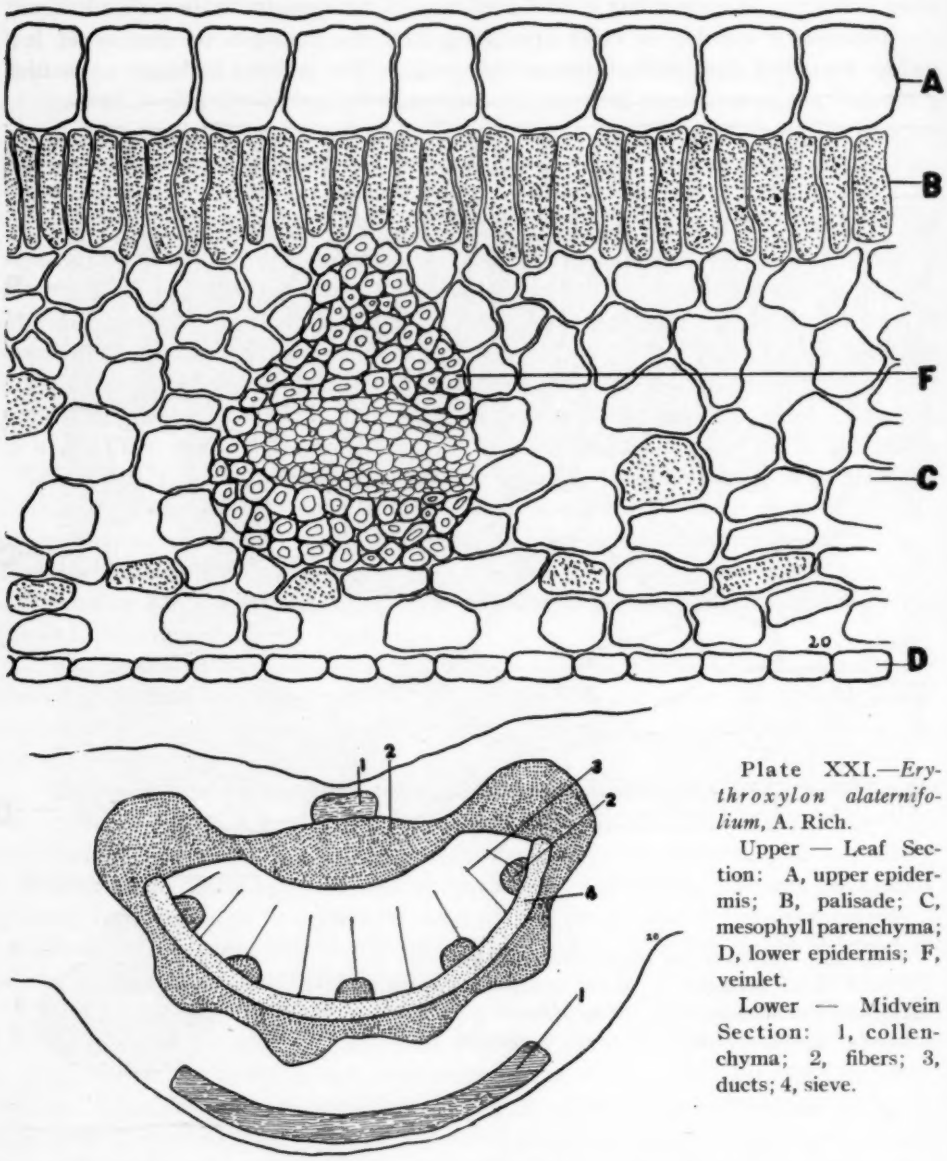


Plate XXI.—*Erythroxylon alaternifolium*, A. Rich.

Upper — Leaf Section: A, upper epidermis; B, palisade; C, mesophyll parenchyma; D, lower epidermis; F, veinlet.

Lower — Midvein Section: 1, collenchyma; 2, fibers; 3, ducts; 4, sieve.

of cells in thickness, isodiametric, irregular and flattened forms being present. The lower layers of parenchyma are apt to be of branched type and of brownish color. Branched sclerenchymatic elements ramify among the cells and prismatic calcium oxalate occurs freely. Large aerating chambers are present through the entire parenchymatic tissue.

The primary vein bundles are very large and in some instances the fibrous tissue extends toward the upper surface so as to partially displace the palisade, while in others the fibers are restricted to the mesophyll. In both instances a few layers of parenchyma intervene between the bundle and the lower epidermis.

The upper leaf surface above the midrib shows a slight indentation. Beneath the central point of this indentation is a small patch of collenchyma and a zone of this material occurs on the lower surface between the epidermis and the fibrous tissue. Pericyclic fibers completely surround the vascular elements, the fibers toward the lower side being in irregular groups and the amount of fibrous tissue being greatest on the upper surface. A secondary zone of fibers occurs between the ducts and sieve.

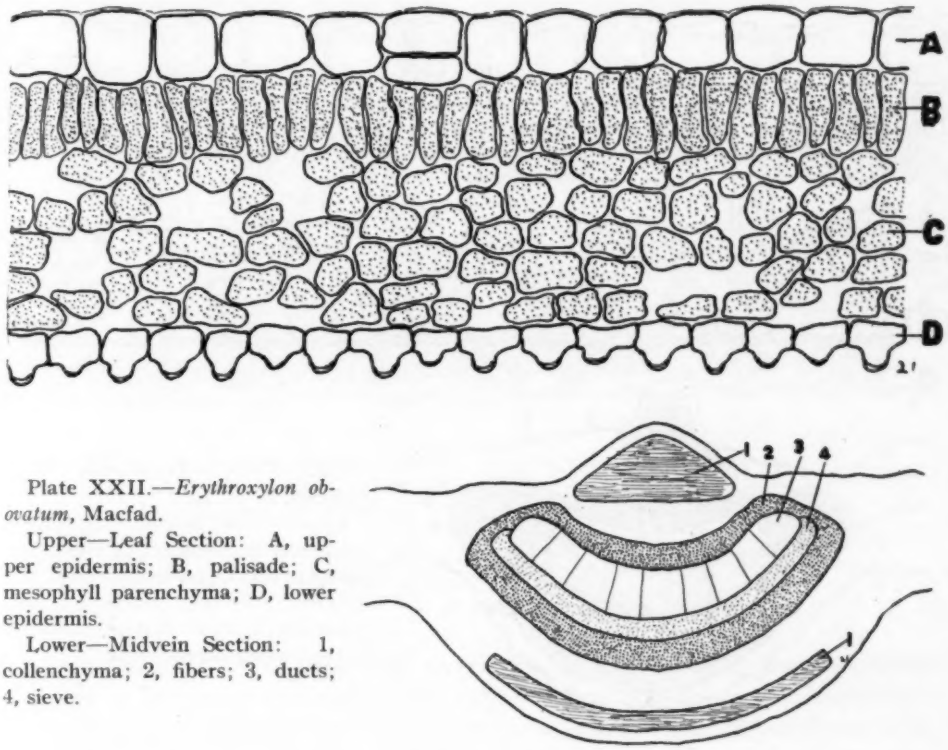


Plate XXII.—*Erythroxylon obovatum*, Macfad.

Upper—Leaf Section: A, upper epidermis; B, palisade; C, mesophyll parenchyma; D, lower epidermis.

Lower—Midvein Section: 1, collenchyma; 2, fibers; 3, ducts; 4, sieve.

Erythroxylon obovatum, Macfad.—(Plate XXII.) Examination of four leaves from two herbarium specimens showed thicknesses ranging between 135 and 170 microns. The upper epidermis consists of rectangular cells which in some instances show subdivision into two. The tendency toward division of upper epidermal cells is more marked in this specimen than in the others examined. The outer cuticle is very thin. Lower epidermal cells bear prominent papillae. Palisade cells are rather irregular, about four times longer than broad and filled with chlorophyll. Two to four palisade cells adjoin each epidermal cell. Mesophyll parenchyma occurs in four to six layers of cells containing a brownish content or filled with chloroplasts. The lower layers are apt to show branched form and prismatic

calcium oxalate occurs in moderate amounts. Fibrous elements in this region show a slight tendency toward branched form.

Primary veins are sufficiently large to partly displace the palisade cells but are separated from the lower epidermis by a few layers of parenchyma.

There is a slight ridge on the upper leaf surface over the midvein. Collenchyma occurs within this ridge and also as a narrow band on the lower side beneath the fiber zone. Pericyclic fibers surround the vascular elements, being more abundant on the upper surface of the bundle.

Erythroxylon Pelletierianum, Spreng.—(Plate XXIV.) Sections of this leaf average 145 microns in thickness. The upper surface is uneven and the epidermal cells are variable as regards size and form, ranging from tangentially elongated to

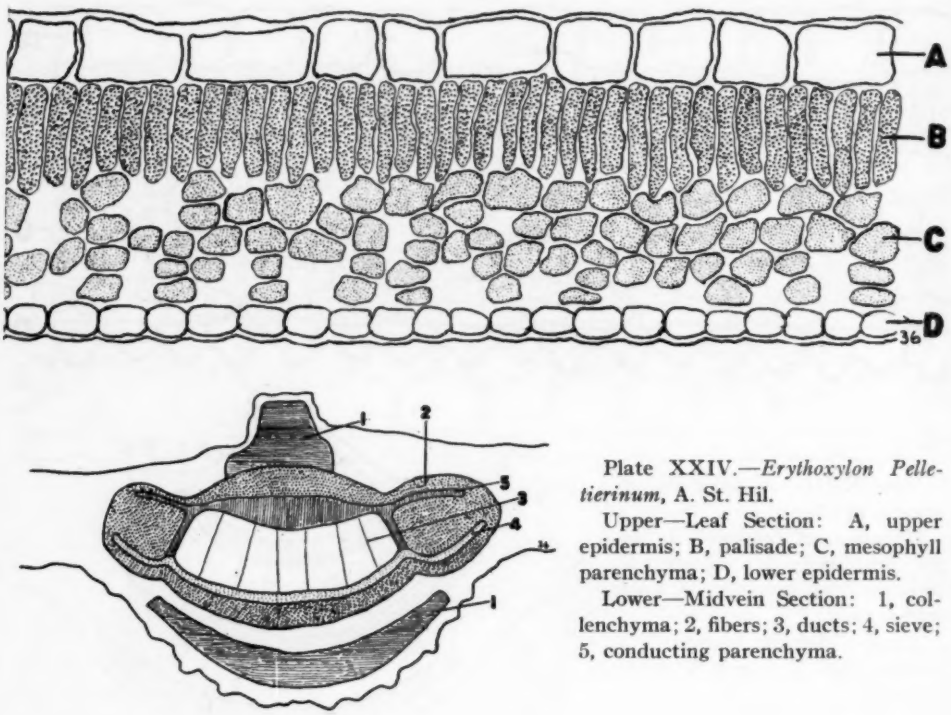


Plate XXIV.—*Erythoxylon Pelletierinum*, A. St. Hil.

Upper—Leaf Section: A, upper epidermis; B, palisade; C, mesophyll parenchyma; D, lower epidermis.

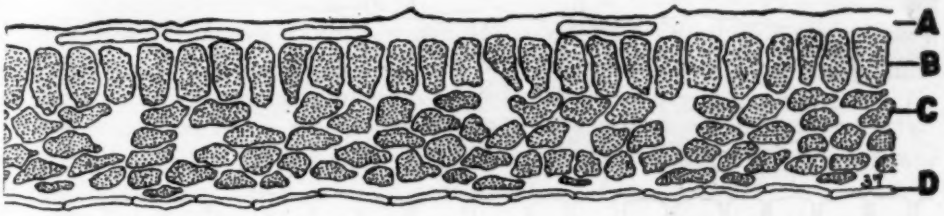
Lower—Midvein Section: 1, collenchyma; 2, fibers; 3, ducts; 4, sieve; 5, conducting parenchyma.

almost square types. The cuticle on the free surface is thick. The lower epidermis consists of rather small flattened cells entirely devoid of papillae and showing a moderately thick cuticle on the free surface. Palisade cells are filled with brownish content, are of varying sizes, and the ratio of height to width averages five to one. The number of palisade cells in contact with each epidermal cell depends upon the size of the latter and varies from two to six. Mesophyll parenchyma consists of three to six layers of isodiametric cells, many of which are filled with a brown content. Prismatic calcium oxalate occurs mainly in connection with the fibrous elements of this region and, while many of the latter are of branched type, little evidence of thickening is apparent. Aerating chambers are rather small and in consequence the parenchyma zone appears fairly compact.

Primary branch veins are very large and the fibrous tissue sheath completely displaces the palisade on the one side and the mesophyll parenchyma on the other; thus the vein extends from upper to lower epidermis. The irregular upper surface mentioned above is due, at least in part, to the large amounts of fibrous tissue causing a slight elevation of the upper epidermal layer over the veins.

The ridge on the ventral leaf surface above the midvein is flattened and similar to that occurring in *E. carthagenense* but is not as much raised above the general leaf surface. Collenchyma occurs both in the interior of the ridge and as a band between the bundle and lower epidermis. The vascular tissues occur as a large central group with a smaller group on each side, these side groups being separated from the central portion by a thin layer of conducting parenchyma. The entire vascular tissue, central as well as side groups, is surrounded by pericyclic fibers. The sieve zone is continuous on the lower side of the ducts and a mass of conducting parenchyma occurs on the upper side. This division of vascular tissues into a central and two subsidiary groups is peculiar to this species.

Erythroxylon nitidum, Spreng.—(Plate XXV.) This Erythroxylon possesses very thin leaves, sections averaging less than 90 microns in thickness. Despite



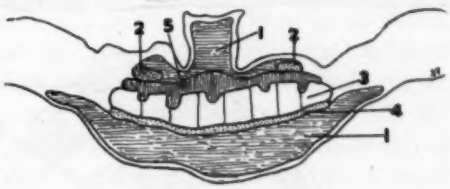


Plate XXV.—*Erythroxylon nitidum*, Spreng.

Upper—Leaf Section: A, upper epidermis; B, palisade; C, mesophyll parenchyma; D, lower epidermis.

Lower—Midvein Section: 1, collenchyma; 2, fibers; 3, ducts; 4, sieve; 5, conducting parenchyma.

repeated attempts it was impossible to prepare sections showing distinct cellular structure in the upper epidermis. The upper surface appears to be covered by a thick cuticle in which every here and there a few cells of an elongated epidermal type are visible. This upper surface also shows many ridges and projections appearing as local thickenings of the cuticle. Lower epidermis was in a better state of preservation and consists of an extremely thin layer of tangentially elongated cells devoid of papillae. Palisade cells are rather broad and irregular in form, being about one-half as broad as they are high. A brown content completely fills these cells. Mesophyll parenchyma is in three to six layers of isodiametric to irregular cells filled with brown content and surrounding aerating chambers of fair size. Although prismatic calcium oxalate is apparent, the amount is very small.

Fibrovascular tissue of the primary vein branches fills the entire region between the upper cuticle and the lower epidermis.

The upper surface of the leaf is depressed in the midvein region and a small crest or ridge, directly over the midvein, is present at about the central point of

this depression. This ridge is flattened as in *E. carthagenense* and *E. Pelletierianum* and its upper or flattened surface is about level with the general leaf surface. The interior of this projection is filled with collenchyma containing a brownish content.

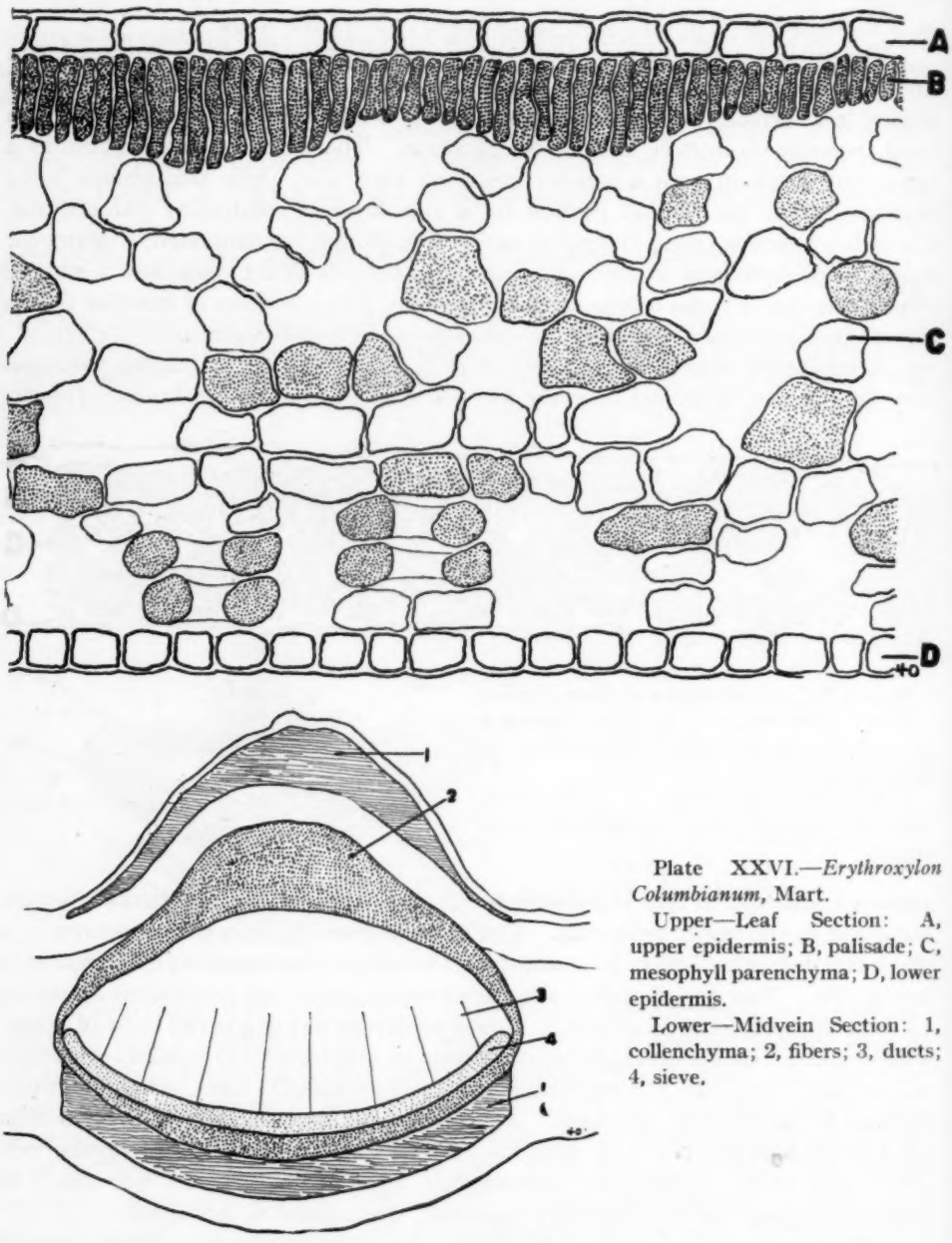


Plate XXVI.—*Erythroxylon Columbianum*, Mart.

Upper—Leaf Section: A, upper epidermis; B, palisade; C, mesophyll parenchyma; D, lower epidermis.

Lower—Midvein Section: 1, collenchyma; 2, fibers; 3, ducts; 4, sieve.

A very broad band of collenchyma is located between the bundle and the lower epidermis, extending into the leaf blade for some distance on each side. In proportion to its thickness, this leaf contains more collenchymatic tissue in the midvein

region than any of the species examined and the amount of fibrous tissue is correspondingly reduced. There are no clear indications of fibers in the midvein bundle excepting two small groups on the upper side of the ducts and conducting parenchyma. The sieve is much reduced but conducting parenchyma is increased in amount and projects into the duct zone.

Erythroxylon Columbianum, Mart.—(Plate XXVI.) Sections of this leaf range from 290 to 320 microns in thickness. The upper epidermis is comparatively thin and consists of tangentially elongated cells varying slightly in length and bearing a moderately thick cuticle on the free surface. The lower epidermis is slightly thinner but consists of the same type of cells, bearing a cuticle and without papillae. Palisade in this specimen shows extreme variability as regards height of the cells, but the variations are so graded as to give an undulated appearance to the lower surface of this tissue. These cells are filled with a brown content and three to five abut on each epidermal cell. The ratio of height to width ranges from two to one up to six to one. The mesophyll parenchyma zone is very extensive, consisting of up to twelve layers of cells and with a large part of this region occupied by the aerating chambers. Collecting or funnel cells appear in the upper part of this region and in general the whole tissue is made up of chains of cells connecting with these. Branched parenchymatic cells are present toward the lower epidermis and these appear in sectional view as two circular cells joined by a slightly constricted band or isthmus. Prismatic calcium oxalate occurs in small amounts both in the mesophyll parenchyma cells and also in the lower epidermal cells.

Fibrous tissue of the primary branch veins is extensive and displaces a part of the palisade but does not extend to the lower epidermis, two or three layers of parenchyma intervening.

The upper leaf surface shows a large and wide elevation over the midvein. This is not the typical ridge of *E. Coca* and differs from the latter in its great width. Collenchyma occurs within this elevation and as a narrow band between the lower epidermis and the fiber zone. The amount of collenchyma in the midvein region is rather reduced as, because of the great amount of fibrous tissue present, this element is not required for adequate support. A band of cells with brownish contents intervenes between the upper collenchyma and the fiber zone. This brown band appears to be a continuation of the palisade across the midvein region but the cells are isodiametric with slightly thickened walls. Pericyclic fibers completely surround the vascular elements, being well developed at all points but greatest in number toward the upper surface of the leaf. The sieve zone is also well marked and the cells show a brownish content. Ducts occur in radiating rows alternating with rays of parenchymatic tissue and a large mass of the latter tissue occurs between the ducts and fibers toward the upper leaf surface.

Erythroxylon orinocense, H. B. & K.—(Plate XXVII.) Sections of this leaf average 105 microns in thickness. The upper epidermal cells are nearly alike in size and form, being of the usual elongated type. A moderately thick cuticle is developed on the free surface. Lower epidermal cells are about half the length of those of the upper layer and devoid of papillae. Palisade constitutes about one-half the tissues between the upper and lower epidermal layers and the cells are variable in form. The chlorophyll throughout this leaf has apparently undergone partial oxidation and is of a brownish green color. The height of the palisade cells

ranges from five times to twice their width, three to four cells abutting on each epidermal cell. Mesophyll parenchyma consists of three to four layers of isodiametric to irregular cells containing brownish chlorophyll and enclosing large aerating chambers. Prismatic calcium oxalate occurs especially in connection with the fibers and these crystals appear in sacs. The lower layers of mesophyll appear as branching cells. Astrosclereids extending into the palisade appear in some sections and not in others.

The primary branch veins are provided with a thick fibrous sheath which not only partially displaces the palisade but also causes an elevation of the upper epidermis at the points of occurrence. On the lower side of the veinlet the fibrous sheath extends to the lower epidermis.

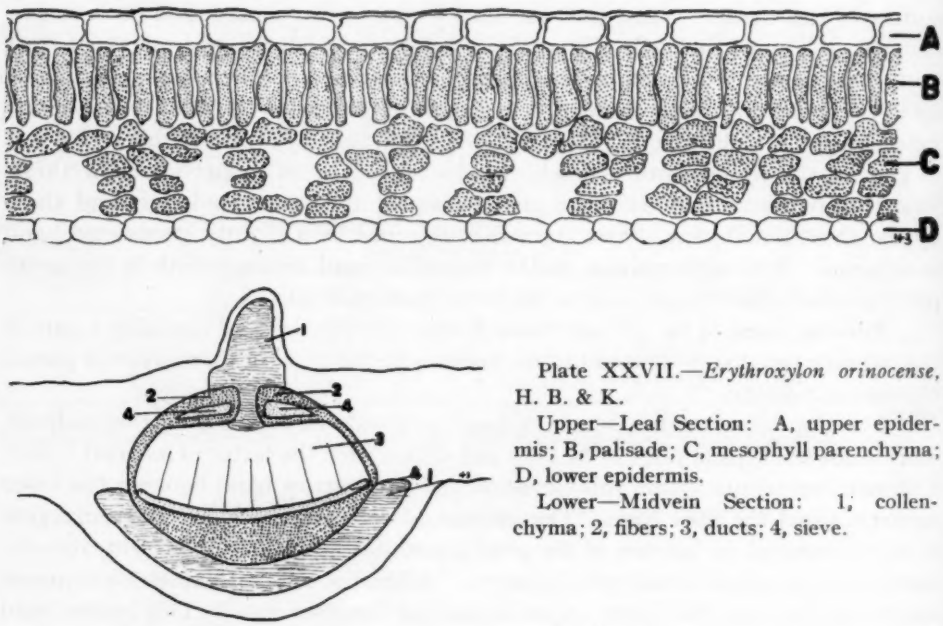


Plate XXVII.—*Erythroxylon orinocense*, H. B. & K.

Upper—Leaf Section: A, upper epidermis; B, palisade; C, mesophyll parenchyma; D, lower epidermis.

Lower—Midvein Section: 1, collenchyma; 2, fibers; 3, ducts; 4, sieve.

A midvein ridge is fairly prominent on the upper leaf surface and is of a type similar to that in *E. Coca*. Collenchyma occurs both within the ridge and as a broad band between the lower epidermis and the fibrous layer. The cell walls of this tissue appear greenish and as if an infiltration of chlorophyll had taken place. The fibrous tissue completely encircles the vascular elements excepting a small area immediately beneath the ridge which is filled with collenchyma. Sieve is well developed and occurs in normal position, but two narrow strips of a similar tissue occur on the upper side of the duct zone. These strips are enclosed by fibrous tissues in which thick-walled ducts also appear. The ducts occur in radiating rows with layers of parenchyma intervening and a mass of the latter material is placed on the upper side of the ducts.

Erythroxylon, "*Haya*."—(Plate XXVIII.) Sections of this leaf average 170 microns in thickness. The upper epidermis consists of large oblong to nearly square cells, the free surface bearing a moderately thick cuticle and the inner wall being

decidedly convex. The lower epidermis is thin and many of the cells bear papillae. Palisade cells vary slightly in length owing to the convexity of the lower side of the epidermal cells and are slightly irregular in form. The proportion of height to width is about four to one and the chloroplasts appear to have collected at the upper ends of the cells. Mesophyll parenchyma is loosely arranged in four to seven layers and the lower part of this region contains large aerating chambers separated from each other by one or two vertical rows of cells. Each of the cells of the uppermost layer of mesophyll parenchyma acts as a collecting cell for several adjoining palisade cells, conforming to the irregularities of the latter. The lowermost cells of this region may be of branched character and appear as ring-like forms in sectional view. Prismatic calcium oxalate occurs mainly in connection with the fibrous elements and many of the latter are of the branched type.

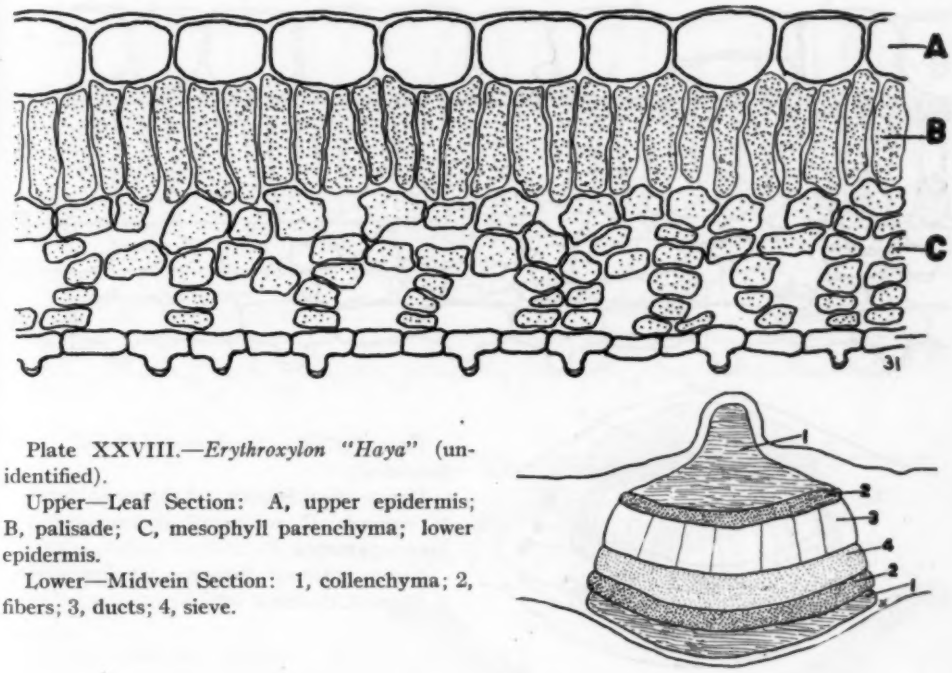


Plate XXVIII.—*Erythroxylon "Haya"* (unidentified).

Upper—Leaf Section: A, upper epidermis; B, palisade; C, mesophyll parenchyma; lower epidermis.

Lower—Midvein Section: 1, collenchyma; 2, fibers; 3, ducts; 4, sieve.

Primary veins are very large and displace both palisade and mesophyll parenchyma, thus extending from the upper to the lower epidermal layer.

The ridge on the upper leaf surface over the midvein is fairly prominent. The interior of the projection contains partially collenchymatized cells which extend inward to the fibers of the midvein bundle. A collenchyma zone also occurs between the lower epidermis and the midvein bundle. Fibrous tissues occur on both sides of the vascular tissues but do not form a complete ring around the latter and at best the amount of fibrous tissue is smaller than in the majority of species examined. Thus the various tissues of the midvein bundle are arranged in definite layers in the following order: fibers, sieve, ducts and fibers.

Erythroxylon—"Wild."—(Plate XXIX.) This leaf averages 170 microns in thickness. The cells of the upper epidermis are very large and for the most part

nearly square, with the inner walls slightly convex. Occasionally these cells have undergone division, the two cells occupying but little more space than the undivided cell. A thick cuticle is present on the free surface of this upper epidermis. Lower epidermal cells are also large and frequently bear papillae of fair size with tips much thickened. Palisade appears as a uniform layer as regards size, form and arrangement, except in the vicinity of the branch veins. These cells are filled with greenish contents, but the outer ends show a brownish deposit which under low magnification appears as a characteristic brown zone immediately beneath the epidermis. Mesophyll parenchyma consists of three to five layers of flattened and isodiametric cells, most of which are filled with brownish material. Prismatic calcium oxalate occurs mainly in connection with the fibrous elements and crystal sacs within the fiber have been observed. Some of the fibers appear in branched

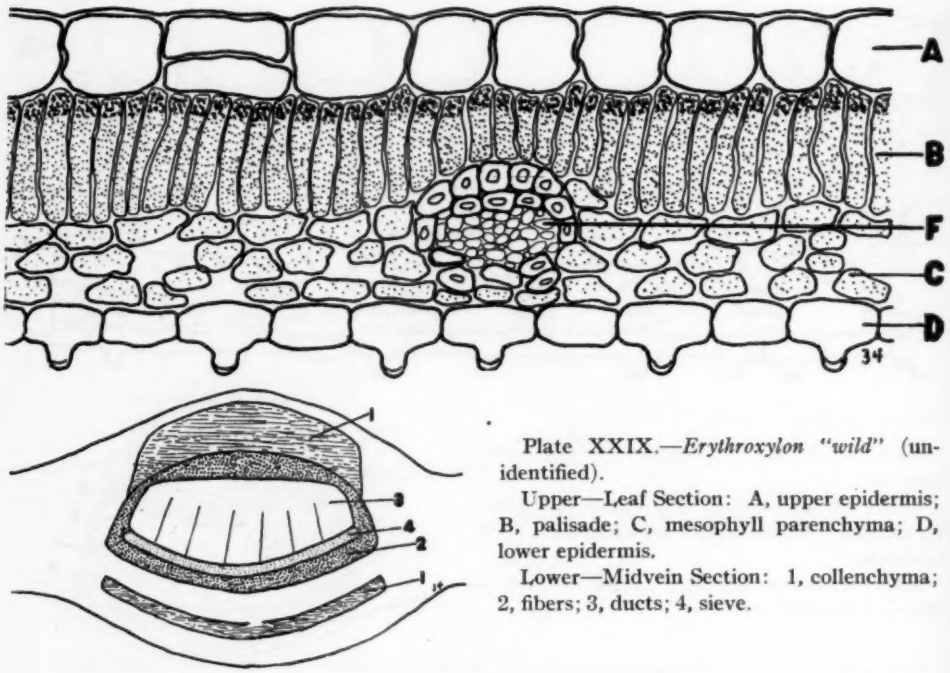


Plate XXIX.—*Erythroxylon "wild"* (unidentified).

Upper—Leaf Section: A, upper epidermis; B, palisade; C, mesophyll parenchyma; D, lower epidermis.

Lower—Midvein Section: 1, collenchyma; 2, fibers; 3, ducts; 4, sieve.

form and with rather thin white walls. The lower layers of mesophyll parenchyma may be of branched type, appearing in surface preparations as a net work in which each cell communicates with several others. Owing to the brown coloration this network is very plainly apparent through the epidermis in surface preparations.

The primary branch veins are located centrally in the leaf and while the fibrous sheath surrounding them encroaches but slightly upon the palisade it usually extends to the lower epidermis.

The upper leaf surface over the midvein shows an elevation which can hardly be compared with the distinct ridge occurring in several other species and the thickening of leaf blade in this region is no greater than occurs in leaves generally. A broad strip of collenchyma occurs on the upper side of the bundle and a narrow strip on the lower side. Pericyclic fibers completely surround the vascular elements

and occur in greatest amount on the upper side. Sieve and ducts occupy normal positions and show no abnormal characters.

"Wild" Coca.—(Plate XXX.) This leaf averages 210 microns in thickness. The cells of the upper epidermis appear in large rectangular forms, occasionally occurring in two layers, and with the free surface strongly cutinized. Papillae occur freely on the cells of the lower epidermis and the thickest portion of the papilla wall is around the apex. The palisade occurs both as single and double layers, being irregular both as to size and form. Three to five cells abut on each epidermal cell. The mesophyll parenchyma consists of six to eight layers of cells surrounding

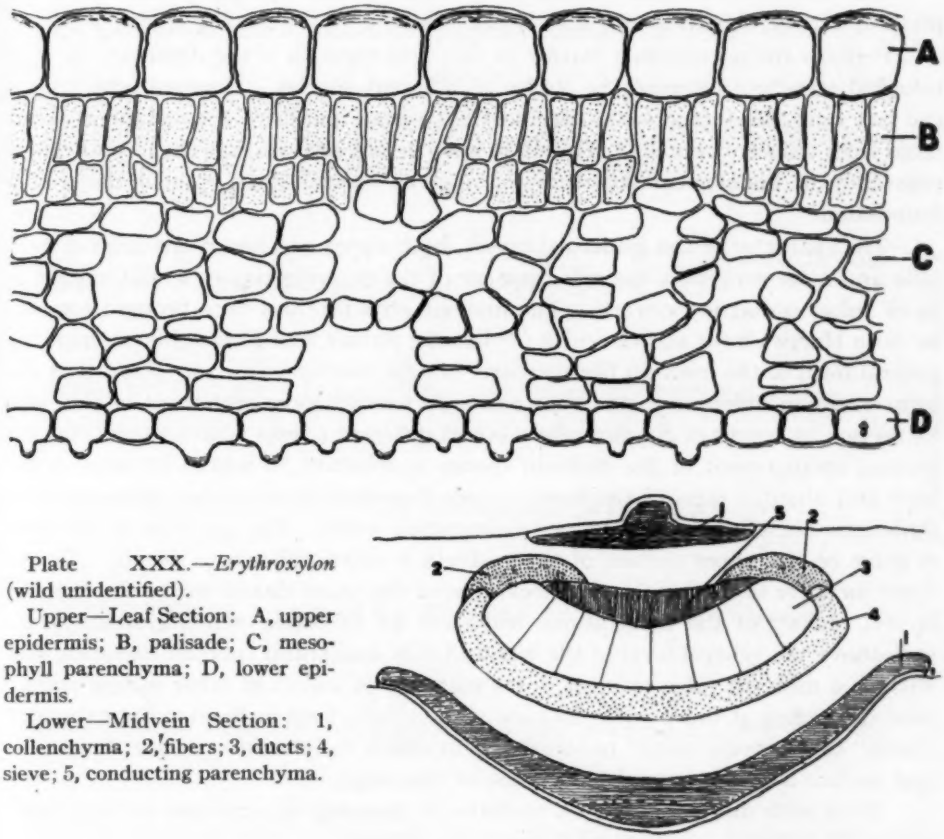


Plate XXX.—*Erythroxylon* (wild unidentified).

Upper—Leaf Section: A, upper epidermis; B, palisade; C, mesophyll parenchyma; D, lower epidermis.

Lower—Midvein Section: 1, collenchyma; 2, fibers; 3, ducts; 4, sieve; 5, conducting parenchyma.

large aeration cavities. Some of these parenchyma cells are of branched form. Calcium oxalate in the usual prismatic form is rather scarce, being more frequent in the fibers. Fibrous tissue in the mesophyll zone shows a slight tendency toward branching form.

The fibrous tissue of the primary veins displaces the palisade layer over these structures and the veins are so large as to fill the space between upper and lower epidermal layers to the exclusion of all other tissues.

The ventral ridge over the midvein is reduced to a mere projection consisting of collenchyma and the fibrous supporting elements of the midvein are largely

replaced by collenchyma. The fibers appear in two groups toward the upper side of the bundle and extend for a short distance around the ends of the duct and sieve zones. Collenchyma is also well developed on the lower surface of the leaf in the midvein region. The sieve zone is well marked and scattered bast fibers occur sparingly in this tissue but the fibrous layer is incomplete on the lower side of the sieve. A mass of partially collenchymatized parenchyma is placed on the upper side of the duct zone.

SUMMARY.

The salient histological characters of the various specimens examined are presented in tabular form as Table 2, page 55.

Perhaps the outstanding feature in this investigation is the difference in histological structure between the leaves of different species. Coupled with this is the fact that these structural differences have been found to be constant in specimens from different sources. Therefore may we not assume that the hypothesis of constancy of histological structure for a given species rests upon a reasonable foundation?

The character of the epidermal layers, both upper and lower, the form of palisade and more especially the arrangement of the midvein tissues would appear to be of value in diagnostic work. The midvein structure has been brought forward by both Hartwich (3) and Greenish (1) but the former based his opinions upon the general form of the midvein fibrovascular bundle and Greenish has shown that the form varies in different parts of the leaf. In verifying the statement of Greenish by sectioning leaves of *Erythroxylon Coca* at different points I have found that the general arrangement of the midvein tissues is constant to within 10 mm. of the base and about 5 mm. of the apex. I am therefore satisfied that these midvein structures are of undoubted value in diagnostic work. The question of the crest or ridge on the upper surface of the midvein is often difficult to decide. To my mind the mere size or height of an elevation at this point should not be the deciding factor. Many of the illustrations will show an elevation which gradually rises well above the general level of the leaf and it is doubtful if such an elevation constitutes a midvein ridge or crest, for a majority of leaves in other genera show a local thickening at this point. In view of these facts I am inclined to limit the term "crest" or "midvein ridge" to structures in which the elevation above the general leaf surface is at least equal to the base of the ridge.

Even with due allowance for variation in histological structure we may make use of the following characters in identification work:

1. Presence or absence of papillae in connection with the lower epidermis.
2. Presence or absence of a ridge or crest on the upper surface of the midvein.
3. Presence or absence of sclerenchymatized elements in the mesophyll and palisade regions.
4. The relative thickness of the upper epidermis.
5. The thickness of the cuticular layer in connection with the upper epidermis.
6. The constancy in form of the palisade cells.

The schematic arrangement or analytical key, page 56, is based upon these characters:

Absence of both crest and general elevation over the midvein is indicated by D and in these leaves a depression over the midvein was apparent.

TABLE II.—SUMMARY OF HISTOLOGICAL CHARACTERS.

Leaves of	Average thickness in microns.	Papillae on under surface.	Height of crest in microns.	Relative thickness in per cent.					
				Upper epidermis.	Palisade.	Mesophyll.	Lower epidermis.	Cuticle on upper surface.	Cuticle on lower surface.	Branched sclerenchyma in mesophyll.
E. Coca (wild)	157	+	+ 241	20	20	50	10	+	—	—
E. Coca (wild)	126	+	+ 105	25	16	43	16	+	—	+
E. Coca (cult.)	157	+	+ 105	14	25	45	16	+	—	+
E. Coca (Huanuco)	126	+	+ 105	16	25	43	16	—	—	—
E. subracemosum	230	+	— 42	20	25	45	10	—	—	—
E. pauciflorum	195	—	+ 81	12	28	49	11	+	—	—
E. Bangii	278	+	+ 197	8	34	50	8	+	—	—
E. cumanense	160	—	— 105	25	30	31	14	—	—	—
E. Popayenense	157	+	+ 126	20	25	35	20	+	—	—
E. areolatum	74	+	+ 53	10	33	43	14	+	—	—
E. areolatum	149	+	+ 95	13	30	45	12	+	—	—
E. areolatum	105	+	— D	16	40	34	10	—	—	—
E. anguifugum	155	+	+ 87	9	25	55	11	+	—	—
E. anguifugum	250	—	— D	12	25	55	8	+	—	—
E. brevipes	210	—	— D	25	30	35	10	—	—	—
E. Urbanii	295	—	— D	25	33	34	8	+	—	—
E. havanense	283	+	+ 116	25	33	40	10	+	—	—
E. minutifolium	350	—	— D	16	33	46	5	+	—	—
E. alaternifolium	315	—	— D	16	16	65	3	—	—	—
E. obovatum	168	+	— 74	20	20	48	12	+	—	—
E. Truxillense	138	+	+ 75	16	25	43	16	+	—	—
E. Truxillense	105	+	+ 32	20	30	30	20	+	—	—
E. Trux. (Ceylon)	100	+	+ 53	11	20	49	10	+	—	—
E. carthagenense	230	+	+ 95	10	30	50	10	+	—	—
E. Pelletierianum	145	+	+ 53	16	33	41	10	+	—	—
E. nitidum	84	+	+ 74	12	20	58	10	+	—	—
E. Columbianum	315	+	+ 284	8	11	76	5	+	—	—
E. Novagranatense	147	+	+ 53	10	25	51	14	+	—	—
E. Novagranatense	84	+	+ 105	10	25	53	14	+	—	—
E. orinocense	105	—	+ 105	10	40	40	12	+	—	—
E. Spruceanum	158	+	— 116	20	25	41	14	+	—	—
E. "Haya"	170	+	+ 137	20	25	44	11	+	—	—
E. wild (unidentified)	210	+	— 40	16	25	47	12	+	—	—

A distinct crest or midvein is indicated by +.
Absence of a distinct crest is indicated by — and figures in connection with this sign represent the general elevation of the upper surface over the midrib.
Absence of both crest and general elevation over the midvein is indicated by D and in these leaves a depression over the midvein was apparent.

ANALYTICAL KEY BASED ON HISTOLOGICAL CHARACTERS.

Papillae present
- Distinct ridge or crest on upper surface of midvein
  - Sclerenchymatized elements present in mesophyll
    - Upper epidermis of large cells with thick cuticle
      - E. Coca (wild growing)—midvein fibers completely encircling vascular tissue; aerating chambers small
      - "Haya" Coca —midvein fibers not completely encircling vascular tissues; aerating chambers large
    - Upper epidermis of small cells with thin cuticle
      - E. Coca (Cultivated) —lower collenchyma separated from fiber zone of midvein; aerating chambers large
      - E. Popayenense —lower collenchyma adjoining fiber zone of midvein; aerating chambers small
  - Sclerenchymatized elements absent in mesophyll
    - Upper epidermis of large cells or with thick cuticle
      - E. havanense —upper surface roughened; midvein ridge bent
      - E. Truxillense —midvein fibers partly encircling vascular tissues; midvein ridge rounded
      - E. carthagenense —midvein fibers completely encircling vascular tissues; midvein ridge flattened
      - E. Novagranatense —midvein fibers grouped at sides of vascular tissues; midvein ridge rounded
    - Upper epidermis of narrow cells or with thin cuticle
      - E. areolatum (Type C) —midvein fibers much reduced or lacking
      - E. areolatum (Type A) —midvein fibers completely encircling vascular tissues
- Ridge or crest absent on upper surface of midvein
  - Sclerenchymatized elements present in mesophyll
    - Upper epidermis of large cells with thick cuticle
      - ?Wild Coca —massive collenchyma zone on upper surface midvein bundle
    - Upper epidermis of narrow cells
      - E. areolatum (Type B) —midvein fibers completely encircling vascular tissues but interrupted by collenchyma on lower side
      - E. Spruceanum —midvein fiber zone incomplete on upper surface and enclosing two small sieve groups on upper side of ducts
  - Sclerenchymatized elements absent in mesophyll
    - Midvein fiber zone completely encircling vascular tissues
      - E. subracemosum —lower collenchyma zone adjoining fibers and thicker than upper; conducting parenchyma prominent on upper side ducts
      - E. cumanense —lower collenchyma zone as thick as upper and both adjacent to fibers; conducting parenchyma reduced in amount
      - E. obovatum —lower collenchyma zone thinner than upper and both separated from fibers; conducting parenchyma absent
    - Midvein fiber zone not completely encircling vascular tissues
      - ?E. Coca (wild) —fibers at sides of vascular elements; lower collenchyma zone extensive

Papillae absent
- Ridge or crest apparent on upper surface of midrib
  - Sclerenchymatized elements present in mesophyll
    - E. pauciflorum —lower collenchyma not in contact with fibers of midvein
    - E. Bangii —lower collenchyma in contact with fibers of midvein; fibers completely encircling vascular elements of midvein
    - E. orinocense —lower collenchyma in contact with fibers of midvein; fibers not completely encircling vascular elements of midvein; two subsidiary sieve groups on upper side of ducts

Sclerenchymatized elements absent in mesophyll
Upper epidermis of large cells
E. anguifugum —fibers not completely encircling vascular elements of midvein; upper collenchyma zone extending to the ducts
E. Pelletierianum —fibers completely encircling midvein vascular elements; lower collenchyma zone separated from fiber layers
Upper epidermis of small cells
E. Columbianum —fibers completely encircling vascular elements of midvein
E. nitidum —fibers in two small groups on upper side of midvein bundle; supporting tissue largely collenchyma
Ridge or crest absent on upper surface of midrib; leaf surface depressed at this point
Sclerenchymatized elements present in mesophyll
Upper epidermis of large cells, heavily cutinized
E. minutifolium —collenchyma absent in midvein region; fibers strongly developed and completely encircling vascular elements
E. alaternifolium —traces of collenchyma in midvein region; subsidiary fiber groups on lower side ducts
Sclerenchymatized elements absent in mesophyll
Upper epidermis of large cells, heavily cutinized
E. brevipes —collenchyma absent in midvein region; fibrous elements in three layers alternating with vascular elements
E. Urbanii —collenchyma absent in midvein region; fibers completely encircling vascular elements of midvein

CONCLUSION.

Early in the course of this investigation it became apparent that, aside from the narrow confines of the subject of leaf variations, the genus *Erythroxylon* offered excellent opportunity for proof or disproof of the value of histological data in connection with the usual procedures in systematic botany. The number of species and varieties in the plant world is constantly increasing and while in many instances this increase is justified, there is the possibility that in others it is not. Slight variations are so common in plants that it becomes a matter of individual judgment whether or not a given plant represents a form sufficiently different from those already described to warrant a new title. It is granted that the easiest way out of the difficulty is to coin a new name but this procedure is not founded on sound scientific principles and must ultimately result in bringing systematic work into disrepute. Even with the natural increase in the number of species, due to botanical exploration work and to the evolution of new forms, our volumes on flora are becoming unwieldy. On the other hand we must not go to the equally objectionable extreme of trying to make a plant fit the written description if the latter is clearly at variance with the material under consideration. Can we accept histological data in connection with morphological characters as an aid toward the happy medium between too few and too many species? If the results of this research are indicative of conditions in general, and it is not unreasonable to conclude that they are, the answer must be in the affirmative. The work of Solereder (15) dealing with the anatomy of the dicotyledons points the way and the use of histological characters in distinguishing between species is merely carrying the plan one step further. Therefore the following broad propositions are offered as worthy of further investigation:

1. Histological characters of the different species in a given genus, while showing a certain degree of agreement also show differences characteristic of the individual species.

2. The histological characters of a given species are sufficiently constant to warrant the admission of this evidence in systematic work.

3. In instances of doubt regarding specific or variational rank, histological data should be given equal value with morphological characters in determination.

While a review of the literature presented in summary form in another part of this work includes the conclusions of a number of botanists and pharmacognosists, these conclusions are largely based upon morphological characters and the variability of opinions has already been commented upon. With the exception of the studies of Hartwich, Greenish and Holmes, dealing with but few species in each instance, no references on comparative histological structure are available. This research has been concerned with the histological structure of a greater number of species and perhaps a greater number of individuals of the same species, and as a result the following conclusions are formulated:

1. That the morphological characters of the leaves of *Erythroxylon Coca* are greatly influenced by environment.

2. That the histological characters of the leaves are not as greatly affected by changes in environment as are the morphological.

3. The modifications in leaf characters as a result of escape from cultivation noted by Rusby (14) are substantiated.

4. *Erythroxylon Novagranatense* appears to be distinct from both *E. Coca* and *E. Truxillense.*

5. The series of specimens (*E. areolatum*) representing Jamaica plants are distinct from *E. Novagranatense,* contrary to the view of Trimen (9).

6. Leaves of a Ceylon grown plant are substantially identical in structure with *E. Truxillense.*

7. Papillae occur in several other species than those noted by Hartwich (3).

8. A crest or ridge may be present on the upper side of the midvein in *E. Truxillense* and in *E. Novagranatense.*

9. "Haya" coca as received, is a form of *E. Coca.*

10. *Erythroxylon Truxillense, E. carthagenense* and *E. Novagranatense* are all closely related.

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CHEMICAL EXAMINATION OF OVARIAN RESIDUE.[1]

II. Alcohol Insoluble, Water Soluble Nitrogenous Extractives.

BY FREDERICK W. HEYL AND BRYANT FULLERTON.

We have conducted the systematic examination of the extractives of ovarian residue, using the methods of Kutscher,[2] with the exception that preliminary percolations of the tissue for the purpose of exhausting the lipoids and alcohol soluble extractives have been carried out. The constituents of the alcoholic extract which may for example contain the betaines, and also the constituents of the filtrate of non-basic materials from the phosphotungstic acid precipitation will be reported upon later.

The phosphotungstates precipitated from the aqueous extract from 4.53 kilograms of the desiccated tissue yielded 27.8 Gms. of organic material containing 4.466 Gms. nitrogen. This material yields 1.11 Gms. creatinine = 0.413 Gm. creatinine N.

The purine nitrogen amounts to 0.508 Gm. But a small portion of this was accounted for by the adenine and xanthine isomer isolated. In fact the usual procedure for the analysis of the purines accounts for less than 0.4 Gm. of purine or perhaps 30% of the purine nitrogen.

The so-called Silver II fraction was not examined quantitatively, but nothing was definitely isolated.

The Silver III or arginine fraction contained 1.06 Gms. nitrogen; yielded 1.2 Gms. arginine equivalent to 0.386 Gm. nitrogen, so that 36% of the nitrogen of this fraction is accounted for.

The lysine fraction containing approximately 1.0 Gm. of nitrogen is almost entirely of unknown composition, 0.71 Gm. of lysine picrate containing but 0.05 Gm. of lysine nitrogen being isolated (0.275 Gm. lysine).

Since it has been customary in this kind of work to report the products isolated, without designating the quantitative considerations it will be noted that the

[1] From the Chemical Research Laboratory of The Upjohn Company. Received for publication April 17, 1926.

[2] "Handbuch Der Biochem. Arbeits. Abderhalden," II, p. 1044.

careful application of approved methods here indicates that they leave larger quantities of the basic constituents unaccounted for than is generally believed. In fact we have learned very little about this extract. It will perhaps prove interesting to hydrolyze either the original extract or the material precipitated by phosphotungstic acid and repeat these separations on the split products.

A summary of our findings will be found at the conclusion of the paper.

EXPERIMENTAL PART.

Preliminary Cold Absolute Alcoholic Extract.—Instead of extracting this tissue at once with water as is customary in the study of nitrogenous extractives, a preliminary extract of the fat free substance from 4.53 Kgs. of desiccated gland was made with absolute alcohol. This has the additional advantage of yielding the lipoids which, while they may have failed to dissolve in ether are now frequently found in the alcoholic percolate.

The alcoholic solution obtained by exhaustive percolation was concentrated in steps and three fractions of insoluble material (A) removed, washed with alcohol and with ether.

This material (A) was emulsified with water and readily separated into a water insoluble part (A, I lipoid) and a water soluble (extractive) part.

The water insoluble part (A, I lipoid) amounted to about 5.65 Gms. It will be reported with the lipoids.

The *water soluble part* of the extracts did not separate until extremely concentrated solutions were obtained, when sodium chloride was obtained. The *water soluble part* of the material which separated from the last alcoholic percolate separated in crusts upon concentrating the aqueous extract from the lipin part. The top fraction weighing about 0.4 Gm. decomposed at 285° and on analysis proved to be largely isoleucine.

Calc. for $C_6H_{13}NO_2$: N = 10.7. Found: N = 10.5%. NH_2 = 11.0%.

The total yield of isoleucine was 2.1 Gms.

The alcoholic filtrates from the less soluble part (A) and the alcoholic and ether washings of (A) were concentrated and poured into ether in which it proved to be very largely soluble. The *ether soluble part* was agitated repeatedly with water which extracted a small amount of material and the *lipoidal ether solution* was put aside.

The material which precipitated, when the alcoholic solution was poured into ether, was emulsified with water; to this mixture ether was added, and after agitation the ether extract was added to the main lipoidal solution. The aqueous layer was also shaken with chloroform, which was returned (after removal of the chloroform) to the lipoid fraction. The united lipoid fraction (B) will be reported upon by Dr. M. C. Hart.

The united aqueous solution of alcoholic extractives will be reported upon later.

Examination of Alcohol Insoluble Residue for Water Soluble Bases.[1]—The ovar-

[1] A portion of the residue which had been percolated with cold alcohol was boiled several times with absolute alcohol and the solution was cautiously concentrated to observe whether or not any cerebrosides could be crystallized, but none were found. The material was in fact entirely water soluble; was treated with normal lead acetate solution, filtered from a slight precipitate and the phosphotungstates prepared in the usual manner. The filtrate from this phosphotungstic precipitate was added to the corresponding main filtrates, and the alcohol soluble bases proved so slight in amount that they were added to the main base solution.

ian residue (extracted as described above) was macerated with 25 liters of water, and heated to 80° for thirty minutes. After cooling, the supernatant extract was removed, and the residue again heated at 80° for thirty minutes with 30 liters further. This extract was removed by filtering through linen bags and a third extract was made with 25 liters further in the same manner. By trial the correct amount of acetic acid for complete coagulation was determined and the extracts were coagulated separately, and the last one concentrated to a volume of 1 liter. Finally the other extracts and washings of the coagulum were concentrated, the final volume being 4 liters, and a small amount of normal lead acetate was added as a preservative.

This extract solidified to a solid gel upon standing. It was diluted to about 10 gallons.

In order to see if anything could be directly crystallized from this extract, a portion of it amounting to approximately one-fifth of the solution was removed, treated with an excess of tannic acid, baryta, sulphuric acid, lead oxide as in the method of Kutscher.[1] The final solutions failed to crystallize either directly or after treatment with hydrogen sulphide.[2]

The entire fraction was now treated in this manner and the final solution was acidified with sulphuric acid and precipitated with an excess of phosphotungstic acid in the usual manner.

Filtrate from Bases.—The filtrate from the base fraction was freed from the excess of phosphotungstic and sulphuric acids with barium hydroxide and then CO_2 and concentrated to a small volume, and the barium was removed quantitatively with sulphuric acid. This will be reported on later.

The precipitated bases were removed by filtration and decomposed by the method of Wechsler.[3]

The concentrated solution was set aside in a desiccator to observe if anything could be crystallized directly, but nothing separated upon prolonged standing. The volume was made up to 350 and a sample of 3.5 cc. was taken out for analytical purposes.

Analysis of Phosphotungstic Acid Precipitable Fraction.—The 3.5 cc. (1% of entire solution) was made up to 50 cc.

5 cc. contained 0.0603 Gm. total solids = 60.3 Gms.

5 cc. gave 0.0325 Gm. ash = 32.5 Gms. ash, leaving only 27.8 Gms. organic material.

2 cc. required by Kjeldahl, 6.38 cc. $N/50$ acid equivalent to 0.0017864 Gm. N or 4.466 Gms. in the entire solution. The organic material contains therefore 16% N.

Creatinine (total) in Base Fraction.—1 cc. + 1.8 cc. 25% H_2SO_4 + 6 cc. water was heated for several hours on the steam-bath and made up to 10 cc.[4] Of this 9 cc. was neutralized and read against a standard creatinine solution containing 0.2 mg. Colorimetrical readings showed 0.000222 Gm. creatinine, or 1.11 Gms. creatinine in the entire solution.

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[1] See "Abderhalden's Handbuch Biochem. Arbeits.," II, p. 1044.

[2] A considerable crystallization of potassium sulphate was obtained. Slight crystallizations, one of which consisted of balls of needles giving murexide test was obtained.

[3] The distillates from the decomposed phosphotungstates yielded 0.5 Gm. ammonia. 5 cc. of solution of the chlorides required 16.85 cc. $N/10$ alkali with methyl red; and 17.05 cc. more after the addition of formaldehyde (Weber and Wilson, *J. Biol. Chem.*, 35, 385 (1918).

[4] Janney and Blatherwick, *J. Biol. Chem.*, 21, 579 (1915); Falk, Baumann and McGuire, *Ibid.*, 37, 528 (1919).

Purines.—35 cc. was analyzed by the method of Falk, Baumann and McGuire[1] and the final copper precipitate was suspended in 400 cc. boiling water and decomposed with H_2S. After the addition of a few drops of 2 *N* acetic acid, the CuS was filtered off and washed with boiling water. The combined filtrate was concentrated on a hot plate to a volume of 50 cc. Of this; 20 cc. required by Kjeldahl 5.08 cc. *N*/50 acid equivalent to 1.4224 mgs. nitrogen or 0.508 Gm. purine nitrogen in the entire solution (11.4% of the nitrogen here is purine N).

Uric Acid.—Another aliquot of the solution, examined by the method of Folin,[2] showed the presence of 0.096 Gm. uric acid in the entire solution.

Separation of the Bases.—The main solution (99%) was acidified slightly with nitric acid and precipitated with 25% silver nitrate solution. The purine silver nitrate compounds were centrifuged. This precipitate was washed twice with water containing a few drops of dilute HNO_3 and a few drops of silver nitrate solution.

The Purine Fraction, which was voluminous, was shaken with about 200 cc. of 10% ammonia and the ammoniacal fluid was removed by the centrifuge. This was repeated twice again, and the insoluble silver compound was finally digested with 500 cc. of warm 10% ammonia. The ammoniacal fluids contained small quantities of soluble silver compounds, which when decomposed with H_2S amounted to 0.15 Gm. amorphous material which contained no guanosine.

The main silver purine residue after the above treatment with ammonia, was freed from ammonia, suspended in water and decomposed with H_2S. The filtrate from silver sulphide was concentrated to a small volume, but nothing crystallized. The material was treated with an excess of 2 *N* hydrochloric acid and concentrated. It proved to be largely soluble; the insoluble material contained no uric acid.[3]

The solution of the hydrochlorides was now examined by the methods of Krüger and Salomon[4] and Krüger and Schittenhelm.[5] The excess of hydrochloric acid was removed by cautious evaporation and it was hydrolyzed with an excess of water at moderate temperature. The insoluble part was slight and yielded neither xanthine nor uric acid.

The soluble part (1.6 Gms.) was made ammoniacal and a heavy precipitate separated, most of which dissolved when shaken with fresh volumes of 1% ammonia. The slight amount of insoluble material gave a doubtfully positive test for guanine with nitric acid. It gave a positive diazo test, and a precipitate with sodium picrate.

The combined ammoniacal filtrates were evaporated to dryness to remove ammonia, redissolved in water and enough hydrochloric acid to make the solution acid to methyl orange. The addition of sodium picrate yielded 0.6 Gm. of very crude adenine picrate equivalent to 0.22 Gm. of adenine or 0.005% of the tissue.

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[1] *J. Biol. Chem.*, 37, 529 (1919).

[2] "Physiological Chem.," Mathews, p. 1019.

[3] The insoluble amorphous material was soluble in dilute sodium hydroxide and precipitated with acetic acid. This was repeated thrice. N = 36.02%; C = 39.42%; H = 2.51%. Calc. for $C_5H_4N_4O_3$: C = 39.46%; H = 2.65%; N = 36.85%. Evaporation with nitric acid yielded little or no yellow substance, and the subsequent addition of alkali caused no alteration in color. Diazo test positive but very slight. While the analytical data agrees closely with xanthine it may be confidently stated not to be this purine.

[4] *Z. physiol. Chem.*, 26, 350 (1898).

[5] *Ibid.*, 35, 153 (1902).

A fraction melting at 270–282° was analyzed.

0.0403 Gm. picrate gave 0.0594 Gm. nitron picrate.
Calc. for $C_5H_5N_5$: $C_6H_3O_7N_3$: $C_6H_3O_7N_3$ = 62.9%.
Found: $C_6H_3O_7N_3$ = 62.4%.

The filtrate from adenine picrate was acidified with nitric acid, picric acid removed with ether, and the solution was reprecipitated with ammoniacal silver nitrate. The silver compound was decomposed with H_2S and on evaporation a small amount of material was obtained. This was redissolved in water and converted into the picrate which in turn was converted into the nitrate,[1] but hypoxanthine could not be identified.

Histidine Silver Fractions.—The filtrate from the silver purines was treated with an excess of silver nitrate and barium hydroxide solution added. After the addition of 10 cc. the solution was still acid to litmus and gave further precipitate with ammoniacal silver nitrate and with baryta. The precipitate H, 1 was removed.

H, 1.—This slight silver precipitate was decomposed in the usual manner and the solution of the bases in dilute sulphuric acid was precipitated with mercuric sulphate solution which yielded a small amount of insoluble mercury salt. The mercury salt decomposed in the usual manner gave a solution containing approximately 7 mgs. of histidine when estimated colorimetrically.[2] No satisfactory preparation of picrolonate could be isolated.

The filtrate from the insoluble mercury salt, when freed from mercury and SO_4 contained approximately 2 mgs. histidine but nothing was isolated.

Baryta was further added to the main solution (40 cc.) the reaction being alkaline to litmus, but precipitates still resulted with ammoniacal silver nitrate or baryta. The precipitate H, 2 was removed.

Baryta was further added (44 cc.). The p_H was about 5.4 but precipitates still resulted with ammoniacal silver and baryta, but were becoming very slight. Precipitate = H, 3.

Baryta was added (40 cc.) and the p_H now = 6.0 and the other histidine tests are negative or very slight. The precipitate is H, 4.

The solution was now saturated with barium hydroxide in substance. The precipitate is H, 5.

The Histidine Fractions, H, 2 and H, 3, were jointly examined exactly as in H, 1. A slight insoluble mercury salt was obtained which upon decomposition yielded a solution containing 42 mgs. of histidine nitrogen equivalent to 157 mgs. histidine. To this solution picrolonic acid was added and 0.12 Gm. of a crude picrolonate separated. Washed with 95% alcohol and recrystallized from water it melted at 205–211° and could not be further purified. This material was impure histidine picrolonate.

The filtrate from the insoluble mercury compound contained 158 mgs. of nitrogen. Freed from $HgSO_4$ quantitatively the concentrated solution was treated with an excess of silver nitrate and the trace of histidine silver removed by the cautious addition of baryta. Arginine could be isolated in small amount (0.1 Gm.) as picrolonate (m. p. 220–228°) from the silver salt precipitated from alkaline solution. The histidine silver fraction showed the presence of 53.8 mgs. of histidine, but nothing could be isolated.

Histidine Fraction, H, 4.—While this fraction continued to show light precipitates with a drop of baryta and ammoniacal silver nitrate, suggestive of the incomplete precipitation of histidine, the solution was nevertheless quite alkaline and might prove to be the arginine fraction;

[1] A. Hunter, *J. Biol. Chem.*, 18, 111 (1914).
[2] Koessler and Hanke. *Ibid.*, 39, 504 (1919).

in short we had difficulty in finding the end-points of this precipitation, and for this reason took out H, 2 and H, 3 in hope of getting a purer preparation of histidine in it.

This precipitate was decomposed in the usual manner, and the mercuric sulphate precipitation carried out. In the histidine mercury precipitate was found 17.7 mgs. histidine nitrogen, but no characteristic picrolonate could be prepared. The sum of the various histidine determinations reported give a maximum value of 0.3 Gm. histidine equivalent to 0.007% of the tissue.

The filtrate from the mercuric sulphate precipitation contained 93.8 mgs. of nitrogen, still yielding 18 mgs. of histidine but nothing except a trace of arginine picrolonate was isolated.

Arginine Fraction, H, 5.—This silver fraction precipitated at high alkalinity, which might be expected to contain arginine, carnosine, methyl guanidine, agmantine, but which should be free from histidine, was decomposed with H_2S in the presence of diluted H_2SO_4. The filtrate from the HgS contained 1.06 Gms. nitrogen.

Carnosine Color Test.[1]—Compared by the diazo color with standard histidine solutions, there was found, histidine = 0.15 Gm. which is equivalent to 0.22 Gm. carnosine.

The solution was concentrated to 100 cc. acidified with H_2SO_4 (5%) and precipitated with mercuric sulphate solution in the presence of alcohol. A small amount of mercury salt separated which was filtered off, washed and decomposed as usual. The sulphate ion was completely removed with $Ba(OH)_2$ and upon evaporation finally in a desiccator a slight amount of syrup resulted, which could be crystallized neither from water nor alcohol. The addition of picrolonic acid gave a slight precipitate which could not be purified.

The filtrate from the mercury salt precipitate was freed from Hg and SO_4, concentrated and treated with somewhat less than the calculated quantity of picrolonic acid. The total yield of arginine picrolonate was 3.03 Gms. equivalent to 1.2 Gms. of the base. The picrolonate decomposed at 228–229°.

Calc. for $C_{10}H_8N_4O_5.C_6H_{14}N_4O_2$: C = 43.8%; H = 5.05%.
Found: C = 43.7%; H = 4.75%.

The filtrate from arginine picrolonate was acidified with normal sulphuric acid and exhaustively extracted with ether. The aqueous solution was treated with a slight excess of barium hydroxide, filtered and the filtrate concentrated at 45° to a volume of 50 cc. This solution contains 0.403 Gm. of nitrogen of unknown source. A quantitative examination for creatinine showed but 0.09 Gm. The solution was treated with picric acid, concentrated to 10 cc. About 0.2 Gm. of an amorphous product separated which was filtered off and then there separated on standing a crystalline crop of prismatic blocks melting, after washing with ether, alcohol and water at 230°. It was recrystallized from water and the melting point was unchanged.

0.0625 Gm. gave 0.1135 nitron picrate.
Calc. for $C_4H_7ON_3$:$KC_{12}H_5O_{14}N_6$: picric acid = 75.2%.
Found: picric acid = 76.8%.

This substance is potassium creatinine picrate and Jaffe's test was positive.

The filtrate was acidified with hydrochloric acid and the picric acid removed with ether. It was concentrated to a small volume and treated with H_2PtCl_6 (0.4 Gm.) but the platinichloride was exceedingly soluble in water. Upon the addi-

[1] Koessler and Hanke, *J. Biol. Chem.*, 39, 504 (1919).

tion of alcohol it separated as an oil which did not crystallize. The residue was dissolved in water, and the platinum precipitated as sulphide which was filtered off and the solution concentrated to a syrup. No crystalline gold salt could be prepared.

The Lysine Fraction, i. e., the baryta saturated filtrate from the arginine fraction was slightly acidified with H_2SO_4 and this reagent was added as long as any more $BaSO_4$ precipitated but the acidity was restrained by the addition of sodium hydroxide. The solution was saturated with H_2S, filtered and slightly concentrated; the lysine fraction was precipitated with phosphotungstic acid. The filtrate amounted to 2 liters.[1]

The precipitated phosphotungstates were decomposed by the method of Wechsler and the solution of the bases concentrated to a syrup in a desiccator. The material is somewhat crystalline, but alcoholic solutions could not be brought to yield a crystalline crop.

An unsuccessful effort was made at this point to separate spermine phosphate.[2] After the removal of the reagents the solution was concentrated to a small volume. It contained 0.9 gram nitrogen.

It was fractionally precipitated with alcoholic picric acid solution and a considerable quantity of potassium picrate separated. This was recrystallized and the solution of the bases was freed from picric acid after the addition of an excess of hydrochloric acid. The solution of the hydrochlorides was taken to a syrup which was finally separated into 3 parts, (*a*) hydrochlorides soluble in absolute alcohol, (*b*) insoluble in absolute, soluble in 95%, (*c*) insoluble in 95% but water soluble.

(*a*) Nothing crystalline was present. It was precipitated with alcoholic $HgCl_2$ yielding a slight indefinite precipitate. Converted into chloroplatinate without obtaining crystals. The filtrate from the mercury salt contained N = 0.45 Gm.; amino N = 0.227 Gm. Amino N after 10 hours hydrolysis = 0.269 Gm. α-Amino N (5 min.) is therefore increased from 50.4% to 64.4%. Solution taken up with water, rendered alkaline with baryta, and the alkaline mercury precipitate yielded 0.1 Gm. lysine picrate. The filtrate from the alkaline mercury precipitate was freed from reagents, reprecipitated with phosphotungstic acid and here 0.17 Gm. lysine picrate resulted.

(*b*) Alkaline mercury precipitation gave a lysine fraction yielding 0.25 gram lysine picrate.

(*c*) Alkaline mercury precipitate yielded a small amount of lysine picrate.

Calc. for $C_6H_{14}N_2O_2.C_6H_3N_3O_7$: picric acid = 61.05%; amino N = 7.47%.
Found: 61.3, 61.2, 61.3 and 60.8. Amino N = 7.34, 7.20, 7.32, 7.62.

SUMMARY.

The basic fraction obtained from desiccated, alcohol and ether exhausted ovarian residue amounts to 0.51% by weight. Basic nitrogen amounts to 0.098%

[1] On account of the dilution here, a portion of this filtrate was freed from phosphotungstic and sulphuric acids with baryta; from the excess of Ba with CO_2 and concentrated to small volume, from which the phosphotungstates were precipitated. Only 0.12 Gm. N is lost in the original phosphotungstic precipitation.

[2] Dudley, Rosenheim and Rosenheim, *Biochem. J.*, 18, 78 (1925).

which includes 0.009% creatinine nitrogen, so that the base fraction may be stated to contain 0.09% basic nitrogen. About 11% of this falls into the purine group from which we isolated adenine as picrate and a substance not xanthine which agreed upon analysis with the formula $C_5H_4N_4O_2$. Separation by means of silver and baryta gives a "histidine" fraction from which nothing but a very doubtful trace of histidine picrolonate could be obtained. It contains considerable material giving the diazo color test. In the arginine fraction amounting to about 24% of the basic nitrogen a considerable quantity of arginine was isolated as picrolonate. Aside from a trace of creatinine picrate also found in this fraction more than half of the material is unaccounted for. In the lysine fraction a very small part of the nitrogen is accounted for by the isolation of lysine picrate equivalent to 0.05 Gm. lysine nitrogen from a solution containing about 1.0 Gm. of nitrogen.

Isoleucine was incidentally identified.

KALAMAZOO, MICH.

STUDY ON THE ANTI-DIABETIC PROPERTIES OF TECOMA MOLLIS.*[1] PRELIMINARY REPORT.

BY G. G. COLIN.

For many years we have been deeply interested in the researches carried out by several investigators who have devoted much time to the scientific study of pancreatic hormones of animal origin.

More recently it has been found that active metabolizing vegetable tissue contains an insulin-like substance which lowers blood sugar.[2,4,6,7] Dr. J. B. Collip[1] experimented with old dry leaves of *Diascia spicata* with negative results.

We have experimented with dry leaves of *Tecoma mollis*[15] (commonly known as "Tronadora" in this country) and obtained a decrease of blood sugar in the diabetic patient. This herb has been and is used considerably by diabetics on account of its beneficial effect. Many of them claim to have been cured by it. This material is carried by all druggists as dry leaves and as a fluidextract, and it is hard to find a doctor who has not prescribed it or at least heard of it.

Dr. Manuel Barreiro of Dr. Gabriel Malda's Clinic has had experience with the administration of this drug and informed us that in many cases very remarkable results are obtained by the use of a simple infusion of Tronadora.

There are, of course, a hundred varieties of herbs claimed to have various curative properties, but in the majority of cases the claimed therapeutic value is mostly imaginary. Bearing this in mind we thought it would be interesting to determine as far as possible the actual therapeutic value of this drug.

Upon questioning some diabetics who have used this drug we found that in some of them sugar in the urine had decreased and finally disappeared in from

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* Central Chemical Laboratory, Mexico.

[1] The funds for this investigation were granted by N. G. Colin to whom the authors express appreciation. Dr. Alvaro Sosa Granados of the Hospital d' Jesus, enthusiastically coöperated by giving valuable suggestions and taking charge of the patients under examination.

EDITOR'S NOTE: The author will welcome coöperation of an institution, equipped for the investigation of the physiological action of this material.

2 to 3 months. Two cases in particular were interesting, one diagnosed as hepatic diabetes and the other as pancreatic diabetes. The urine in both patients became sugar-free in about 3 months. These patients state that they are eating a free diet and even indulge in eating candy in moderate amounts without sugar appearing in the urine.

Diabetics take this drug in the form of an infusion or as fluidextract. The first step in this investigation was to ascertain the composition of the drug. According to the Mexican Pharmacopœia the composition is as follows:

Fatty matter	1.24– 2.10%
Resins	12.00–14.00%
Alkaloid soluble in chloroform	0.28– 0.30%
Alkaloid soluble in ether	0.03– 0.05%

From the method of preparation of extracts commonly used, whether hot water extraction or using 80% alcohol as menstruum, the alkaloidal content of the drug does not appear in the extract. Our examination of the solutions prepared by either method failed to show the presence of alkaloids.

The fluidextract contained a fairly large amount of gums and resins which were easily precipitated by dilution with 2 to 3 volumes of water and allowing to stand several hours and filtering. This precipitate contains a large amount of gums and resins easily soluble in 10 per cent NaOH and a very small amount of insoluble residue. Examination of the solution free from gums and resins when treated with several reagents gave the following reactions:

Reagent.	Solution acidified with HCl.	Solution without HCl.
Millon		×××
Picric acid	—	—
Mayer	—	—
Hydrochloric acid	××	
Nitric acid	××	
Acetic acid		—
Absolute alcohol		—
Phosphotungstic acid	×××	×
Wagner		××
Potassium ferrocyanide and acetic acid		—
Lead acetate		×××
Saturated ammonium sulphate		×××
Magnesium sulphate		××
Biuret		× faint
$K_2Ce_2O_7$		×
Bromine		×

With hydrochloric and nitric acids the precipitate redissolved on warming and reappeared on cooling. With phosphotungstic acid the amount of precipitate increased upon acidifying with hydrochloric acid. The greatest amount of precipitate was obtained with Millon, lead acetate, and ammonium sulphate reagents. From these results, the proteins present appear to be proteoses. The abundant precipitate obtained with Millon's reagent suggests the presence of a protein, such as tyrosin, since it precipitates phenol derivatives in which one hydrogen atom has been substituted by a hydroxyl group. In order to confirm this assumption, proteins were precipitated by saturation with ammonium sulphate,

filtered, washed, redissolved and treated with the same reagent. Since gallic acid is present and this substance is precipitated by this reagent, there is a possibility that the proteins were not or could not be thoroughly freed from contamination with gallic acid by the process used.

The solution was also treated with gelatin and with hide powder, but the coloration produced upon adding $FeCl_3$ persisted after the process of detannization.

The fact that a simple infusion of the drug has anti-diabetic properties led us to prepare an aqueous extract by a method similar to that employed by Dr. Nixon of Texas in the preparation of an injectable solution of *Castella Nicholsoni*.[14]

This extract for hypodermic use was tested for toxicity in guinea-pigs and rabbits; 2 cc. per Kg. wt. in the guinea-pig and 3.5 cc. per Kg. wt. in the rabbit proved to be harmless. There was no formation of abscess nor any other apparent undesirable effect.

Chopra and Bose[13] experimented in India with an herb called *Cephalandra Indica*, but when they injected it they found it had no effect.

In order to determine whether the Tronadora extract would have any effect on blood sugar when applied subcutaneously to the diabetic, we tested it in small doses at the Hospital de Jesús Nazareno, under the supervision of Dr. Alvaro Sosa.

The results were positive as far as blood sugar is concerned. Blood sugar determinations were made with a Kuttner's microcolorimeter. Patient E-9, a woman 48 years old, married, weighing 43 kilos—the results were as follows: Average blood sugar before treatment 0.560 per cent.

	Date.	Blood sugar before injection.	Blood sugar 2 hours later.		Per cent.
1	2/ 8/26	0.472%	(1 cc.)	0.452 (fasting)	4.2
2	2/18/26	0.436%	(1 cc.)	0.372 (fasting)	14.5
3	2/19/26	0.388%	(1 cc.)	0.316 (fasting)	18.6
4	2/23/26	0.412%	(2 cc.)	0.360 (not fasting)	12.1

Experiments 1, 2 and 3 were made in the morning, about $2^1/_2$ hours after breakfast and before lunch. Experiment 4 was carried out to determine the effect of food upon blood sugar when under action of the extract injected. Two hours after the injection of 2 cc. and allowing the patient to have her lunch, there was an increase in blood sugar to 0.420 per cent, but five hours later blood sugar had fallen to 0.360 per cent.

PATIENT E-12, A WOMAN, MARRIED, 62 YEARS OLD, WEIGHING 43 KILOS.

1	1/12/25	0.560%	(1 cc.)	0.340%	39.3
2	2/10/26	0.436%	(1 cc.)	0.360%	17.4
3	2/10/26	0.376%	(1 cc.)	0.368%	2.1
4	2/15/26	.....	(1 cc.)	0.256%	..
5	2/18/26	.....	(1 cc.)	0.300%	..
6	2/19/26	0.324%	(1 cc.)	0.208%	35.8
7	2/23/26	0.372%	(1 cc.)	0.350%	5.9

It will be noticed from the foregoing that blood sugar did not rise to its original glucose content. These results confirm Dr. J. B. Collip's[1] statement that vegetable extracts do not have as quick an action as insulin, but their effect is more lasting. The extract used was called 2 *N* (twice normal) or each cc. representing the active substance of 2 Gms. of material.

In some instances a decrease of 36 to 39 per cent of the original blood sugar value was obtained. The patients stood the injections without any discomfort. The injections were always applied subcutaneously, in the buttocks.

Due to lack of facilities we have not been able to determine the effect of the extract on the respiratory quotient, nor have we been able to define whether our results could have been improved had we met with good coöperation from the patients regarding diet. Considerable difficulties were experienced in trying to control the diet of the patients.

We were unable to establish any relation between blood sugar and sugar excretion in the urine. Much to our surprise, even at the lowest blood sugar levels obtained, sugar in the urine was relatively high. Before the treatment both patients had from 6 to 7 per cent glucose in the urine (by Benedict's method) and the lowest content recorded during the experiments was 4 per cent. The sugar in the 24-hour specimens never fell below 250–300 Gms., even when blood sugar was as low as 0.200 per cent. Later, we discovered that the patients were not strictly following our orders regarding diet, since they were given large amounts of white bread and beans.

Patient E-9 felt much better. There never were even traces of acetone and diacetic acid in her urine. However, Patient E-12 had a severe case of acidosis. Diacetic acid and acetone were present invariably except in three analyses, but since the diet control was not efficient we could not determine the cause of the disappearance of these two substances. Patient E-12 had been previously treated with insulin without any results.

This investigation is far from complete. We have found ourselves highly handicapped from lack of facilities, coöperation and apparatus, but we think it is worth while to determine more definitely the physiological action of this extract when administered subcutaneously. We have no specific data regarding the effects of its oral administration although it is commonly taken that way. Our knowledge of its effect orally administered comes from the patients themselves. The two patients treated did not show any signs of improvement when the extract was given to them for a period of 60 days—30 drops before meals, three times daily.

CONCLUSIONS.

1. A vegetable extract possessing hypoglucemia properties has been prepared.
2. Its effect is apparent when injected subcutaneously. A fall in blood sugar is observed two hours after injection of 1 cc.
3. The solution can be sterilized by boiling without affecting its properties.
4. The clinical data obtained furnish no evidence of its beneficial effects when administered orally.
5. Sugar in the urine could not be controlled, presumably due to a faulty diet.
6. Further investigation is needed to determine more definitely the physiological action of the extract studied.

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April 14, 1926.

THE RELAXING ACTION OF SOME AROMATIC ESTERS.

BY E. V. LYNN AND DOROTHY GASTON.

Theoretically the relaxation of spasmodic conditions of muscle or nerve may be described by the term antispasmodic but by custom this word is usually restricted to any substance which will relieve strong contractions of unstriated muscular tissue. This effect may be gained by depressing the cerebral, spinal or medullary centers which control, by action upon the peripheral nerve ends, ganglionic or post-ganglionic, or by direct effect upon the muscles. The first two methods are very effective and often utilized, but the accompanying secondary and side actions are generally undesirable or even dangerous. The opiates and atropine are good illustrations.

Of all the drugs which act directly upon the muscle structure, the nitrites are preëminent, but papaverine is the most important compound of the group from our standpoint. The antispasmodic action of papaverine was first reported[1] in 1902 and has since been extensively investigated. Macht, during a long series of experiments, noted that those opium alkaloids of the papaverine class which contained the benzyl group were relaxing, while the morphine alkaloids, which did not have this group, were not possessed of the property.[2] He, therefore, examined the action of several benzyl derivatives of a simpler nature and found that benzyl alcohol and a number of its esters are capable of relieving spasmodic contractions of excised muscular tissue of the blood vessels, intestines, ureter, uterus, etc. Benzyl benzoate was then introduced to the trade for therapeutic purposes and the succinate has since followed it. The acetate, acetylsalicylate and others have also been used occasionally. Administered by mouth they seem practically harmless in fairly large amounts, and the apparent lack of clinical success has, therefore, been rather surprising, for there seems no question at all about the paralyzing

[1] Pal, *Zeit. f. Physiol.*, p. 68 (1902).

[2] Macht, *J. Pharmacol.*, 8, 155, 261 (1916); 9, 197 (1916); 9, 287 (1917); 10, 96 (1917); 11, 419 (1918).

effect *in vitro*. Therapeutically the further development of the benzyl esters may appear futile, but the interest of the pharmacologist cannot but be spurred by this seeming contradiction.

One phase of the subject which does not seem to have been investigated is action of esters of alcohols closely related to benzyl alcohol and we deemed it worthy of some study. For this we selected phenyl propyl alcohol, $C_6H_5.CH_2.CH_2.CH_2OH$, which is closely related to cinnamyl alcohol and the cinnamates found naturally in storax and in Peru balsam. The two isomers of phenyl propyl alcohol, phenyl ethyl carbinol, $C_6H_5CHOH.C_2H_5$, and benzyl methyl carbinol, $C_6H_5.CH_2.CH(OH)CH_3$ were also prepared, and each of the three alcohols esterified to form the acetate and the benzoate. Mandelic acid has been found by others to possess antispasmodic action, also its ethyl ester, but no attempt appears to have been made to investigate the acyl or aryl derivatives; accordingly mandelyl acetate and benzoate were also prepared.

Phenyl n-Propyl Alcohol.—$C_6H_5.CH_2.CH_2.CH_2OH$. This compound, which was previously described by Conant and Kirner,[1] was prepared in the usual manner by the Grignard reaction from ethyl magnesium bromide, benzyl magnesium chloride and ethylene chlorhydrin. Dibenzyl was obtained in considerable quantities as a by-product but the yield of alcohol was yet nearly 60 per cent. It is a thick, colorless liquid with a slightly aromatic odor and boiling at about 235° C. at 760 mm., specific gravity 1.008 at 18° C. It is somewhat soluble in water and completely miscible with alcohol and ether.

The acetate is described by Rügheimer[2] as a thick fluid, boiling point 244–245°; the benzoate is spoken of as a thick brownish fluid and is not further described.

Phenyl Propyl Acetate.—The acetate was made by slowly adding acetyl chloride in equivalent quantity to the warm alcohol and continuing the heat for a few minutes, the product being poured into water and extracted with ether in the usual way. It is a liquid with a very pronounced odor strongly resembling that of bananas. It may also be prepared by the use of acetic anhydride in place of acetyl chloride and with a trace of sulphuric acid added.

Phenyl Propyl Benzoate.—The alcohol was warmed very gently with an equal quantity of benzoyl chloride for about one-half hour. Hydrogen chloride was evolved copiously in the first few minutes but disappeared after about fifteen. The product was poured into water and extracted with ether as before. Phenyl propyl benzoate is a thick liquid with a pleasant odor less noticeable than that of the acetate. Boiling point 262° C.

Benzyl Methyl Carbinol.—$C_6H_5.CH_2.CH(OH)CH_3$. This alcohol has been described as formed by the reduction of methyl benzyl ketone and Tiffeneau and Delange[3] mention that it may be prepared by the Grignard reaction. Accordingly, benzyl magnesium chloride was first prepared from 4 Gms. of magnesium turnings and 20.8 Gms. of pure benzyl chloride in the usual manner. When this reaction was apparently complete, the calculated amount of paraldehyde (12 cc.) in 50 cc.

[1] Conant and Kirner, *J. Am. Chem. Soc.*, 46, 232 (1924).
[2] Rügheimer, *Ann.*, 172, 122 (1874).
[3] Tiffeneau and Delange, *Compt. rend.*, 137, 573 (1903).

of anhydrous ether was allowed to flow in. After reaction had ceased, the flask was heated for thirty minutes and the contents then poured into acidified ice water to effect decomposition, the oily layer being extracted with ether and fractionated. The yield is considerably lowered by the formation of dibenzyl and of toluene, so that better results may be obtained using the method of Rassow and Burmeister[1] which, however, requires reagents not usually available. The alcohol is a liquid boiling at 214.5–215.5° C.

Benzyl Methyl Carbinol Acetate.—This was prepared by heating together the alcohol, acetic anhydride and a very small quantity of sulphuric acid, the product being poured into water and collected with ether as before. It is a liquid with a very pleasing aromatic odor, heavier than water, in which it is very slightly soluble, boiling point 225–226° C. It is miscible with alcohol and ether in all proportions.

Benzyl Methyl Carbinol Benzoate.—The alcohol was benzoylated by the Schotten Baumann reaction using very dilute sodium hydroxide solution. The ester separated after some time and was collected with ether. It is a somewhat thick liquid with a boiling point of 271–272° C. and a very pleasing odor resembling slightly that of the acetate.

Phenyl Ethyl Carbinol.—$C_6H_5.CH(OH).CH_2.CH_3$. This was successfully prepared by the Grignard reaction, using magnesium, ethyl bromide, a crystal of iodine as catalyst and benzaldehyde. The product was poured into water and collected with ether, the residue being fractionated at 26 to 28 mm. pressure. The pure alcohol boils at 210–211° at 760 mm., 105–110° at 28 mm. It is a colorless liquid with an aromatic odor.

Phenyl Ethyl Carbinol Acetate.—Acetylization of the alcohol proceeded readily using acetic anhydride, the product being collected as before. It is a colorless liquid with a very pleasant odor faintly resembling the carbinol, boiling point 225–225.5° C.

Phenyl Ethyl Carbinol Benzoate.—The Schotten Baumann reaction was unsuccessful in producing the benzoate but the latter was finally prepared by warming very gently a mixture of dry benzoyl chloride and the carbinol in molecularly equivalent quantities. Collected in the usual manner with ether, the ester is a thick viscous liquid boiling at 290–291° C. and possessing an exceedingly pleasant odor.

Mandelyl Acetate.—$C_6H_5.CH(OCO.CH_3).COOH$. The acetate was made according to the method of Anschütz and Böcker,[2] by heating acetyl chloride and mandelic acid together upon the steam-bath. The resulting syrupy liquid was dissolved in chloroform and precipitated in a freezing mixture with petroleum ether. The ester was crystallized with difficulty in shining white crystals melting at 80°. When recrystallized from water it contains water and melts at 60°.

Mandelyl Benzoate.—$C_6H_5.CH(OCO.C_6H_5)COOH$. Mandelic acid was benzoylated by the Schotten Baumann reaction in 10 per cent sodium hydroxide solution. The ester was precipitated by hydrochloric acid and recrystallized several times from hot water, as white crystals melting at 115–116° C.

In order to test the depressor or relaxing action of the esters so prepared, they were applied to active sections of rat intestines and the results recorded on the

[1] Rassow and Burmeister, *J. prakt. Chem.*, 84, 473 (1911).

[2] Anschütz and Böcker, *Ann.*, 368, 53 (1909).

kymograph. The muscle was suspended in a chamber filled with Locke's solution at 37°, and when peristaltic action was thoroughly established, 1 cc. of a solution of the ester was dropped into the chamber. A stream of oxygen which was kept bubbling through the cell served to distribute the solutions thoroughly. All liquid esters were made into 50 per cent solutions with alcohol, while the solid ones were made 20 per cent in alcohol.

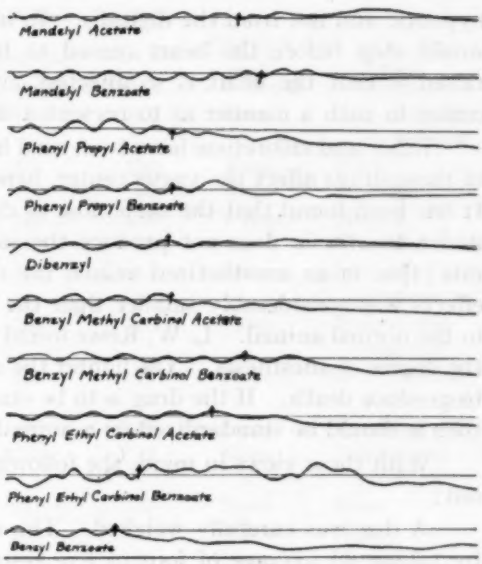

Chart I.

The results of the tests show that all the members of this series possess inhibitory or depressant action upon smooth muscle to about the same extent as does benzyl benzoate. It may be seen by the accompanying chart that in all cases the compounds caused cessation of peristaltic action, while in some instances there was a stretching of the muscle to a greater degree than when it was at the relaxed stage of the peristaltic movement.

COLLEGE OF PHARMACY,
UNIVERSITY OF WASHINGTON,
SEATTLE, WASH., August 20, 1925.

CHEMICAL AND BIOLOGICAL ASSAY OF DRUGS.*

DIGITALIS STANDARDIZATION: UNDER ANESTHESIA.

BY J. B. BERARDI.

The action of drugs upon living organisms depends upon the state of the particular constituent parts, which go to make up the organisms. The state may be altered by seasonal variations, age, sex and previous administration of other drugs, etc. For example, when small doses of morphine are given in cases of broken compensation, the action of digitalis is altered. In some cases digitalis given in large doses prior to the administration of morphine produces no definite cardiac response, while in other cases, small doses of digitalis given after the administration of morphine produces full response.

The methods of standardization of digitalis, which are constantly receiving a great deal of consideration, utilize an animal which is anesthetized before standardization of the drug is carried out. The most commonly used is known as the Hatcher's cat method. In this method the preparation to be standardized, suitably diluted, is injected intravenously into an anesthetized cat.

Many objections have been raised to the use of these methods, the most outstanding one being that the death of the animal is produced by the anesthetic or

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hypnotic and not from the digitalis. In many cases it was found that respiration would stop before the heart ceased to beat. Another objection which is often raised is that the heart is so affected, either directly or indirectly, through its center in such a manner as to present a different digitalis action.

Ether and chloretone have been used in the standardization of digitalis. Both of these drugs affect the vagus center, hence produce an acceleration of the heart. It has been found that the same dose of digitalis when administered to an animal under anesthesia does not produce the same percentage of slowing in the heart rate; that in an anesthetized animal the dose required to produce death or toxic effects was considerably smaller than the dose necessary to produce toxic effects in the normal animal. L. W. Rowe found that the M. L. D. per kilo depends upon the degree of anesthesia. The lighter the anesthesia the more digitalis is necessary to produce death. If the drug is to be standardized for its therapeutic properties, then it should be standardized on a normal heart and not on one under anesthesia.

With these views in mind, the following therapeutic experiments were carried out:

A dog was carefully weighed. The normal heart rate was then determined by taking an average of four or five results at ten minute intervals. (It is important to get an accurate count without exciting the animal.) A definite amount of tincture of digitalis, diluted with physiological salt solution, was then given intravenously. After the injection the animal was carefully watched. The heart rate was taken every ten minutes until the greatest drop had been recorded and the heart showed signs of returning to normal.

1. The first series of dogs received no ether. (See Table I.)

2. The second series of dogs were anesthetized and then digitalis was administered. The heart rate was taken before anesthesia, during anesthesia, and during anesthesia with digitalis. (See Table II.)

3. The third series of dogs were given digitalis first and then anesthetized with ether. The heart rate was taken before anesthesia, after the administration of digitalis, and during digitalis action and anesthesia. (See Table III.)

TABLE I.

Weight in kilos.	Dose in cc. of digitalis.	Dose per kilo.	Normal heart rate.	Digitalis heart rate.	Slowing of heart as compared with normal.	Toxic symptoms.
15.9	0.318	0.02	121	100	21	None
21.8	0.438	0.02	124	100	24	"
26.8	0.536	0.02	96	76	20	"
10.7	0.214	0.02	120	88	32	"
9.3	0.186	0.02	108	84	24	"
9.8	0.196	0.02	115	93	22	"
14.5	0.29	0.02	130	98	32	"
17.5	0.35	0.02	122	96	26	"
10.0	0.2	0.02	98	82	16	"
10.94	0.208	0.02	137	114	23	"
17.3	0.356	0.02	112	90	22	"
23.6	0.462	0.02	102	87	15	"
5.8	0.116	0.02	118	90	28	"
14.0	0.28	0.02	104	84	20	"
18.8	0.376	0.02	118	90	28	"

TABLE II.

Weight in kilos.	Dose in cc. of digitalis.	Dose per kilo.	Normal heart rate.	Heart rate under anesthesia.	Heart rate under ether and digitalis.	Slowing of heart as compared with normal.	Toxic symptoms.
14.0	0.28	0.02	107	169	132	None	Incr. rate of respiration
13.3	0.25	0.018	98	176	150	None	None
8.7	0.174	0.02	108	150	140	None	Diarrhea
5.1	0.102	0.02	145	166.2	136	9 Beats	None
10.94	0.208	0.02	138	180	150	None	Vomiting
21.8	0.438	0.02	126	178	148	None	Incr. rate of respiration
17.3	0.34	0.02	118	156	122	None	Nausea and vomiting
14.0	0.28	0.02	104	172	141	None	Incr. rate of respiration
23.0	0.46	0.02	106	182	140	None	Vomiting
16.0	0.32	0.02	112	170	132	None	Nausea and vomiting
10.3	0.206	0.02	140	181	152	None	None
9.8	0.196	0.02	118	156	117	1 Beat	None
9.3	0.186	0.02	104	148	120	None	Vomiting

TABLE III.

Weight in kilos.	Dose in cc. of digitalis.	Dose per kilo.	Normal heart rate.	Digitalis heart rate.	Digitalis and ether heart rate.	Slowing of heart as compared with normal.	Toxic symptoms.
10.94	0.208	0.02	137	114	140	None	None
21.8	0.438	0.02	122	98	134	None	Vomiting
14.0	0.28	0.02	112	90	128	None	None
18.5	0.19	0.02	108	80	112	None	None
16.3	0.326	0.02	119	90	115	4 Beats	None
8.4	0.168	0.02	120	92	131	None	Vomiting
6.8	0.136	0.02	140	116	139	1 Beat	None
13.6	0.272	0.02	130	110	138	None	Vomiting
12.2	0.24	0.02	102	84	121	None	Diarrhea
10.1	0.202	0.02	126	98	132	None	None
23.4	0.468	0.02	120	96	118	2 Beats	None
8.4	0.168	0.02	116	93	126	None	Vomiting
13.1	0.262	0.02	102	80	112	None	None

DISCUSSION.

From the foregoing experiments it was found that doses of digitalis when given to the normal animals produced no toxic effects, but when the same doses were given to the same animals under anesthesia, toxic symptoms appeared.

The dose necessary to produce toxic effects or a certain percentage drop in heart rate in a dog depends upon the normality of the cardiac mechanism upon which the drug is to act. Therefore, if the drug is to be standardized, it is to be done on a normal animal, as a wide difference in the preparations standardized on an anesthetized animal may occur. From a clinical standpoint, it is important to decrease the dose of digitalis administration before operation under ether as the anesthesia increases the toxicity of the digitalis.

From the experiments carried out on dogs, one would be led to believe that digitalis as a heart inhibitory stimulant is of no value during active anesthesia.

Note.—The tincture of digitalis used in these experiments was standardized by the following method, which briefly consists of the intravenous injection of the drug into a normal dog without anesthesia. The heart rate is counted before and after the injection of the drug and the slowing of the heart rate is taken as a measure of the activity of the drug. If the preparation be of standard strength, 0.02 cc. of the tincture per kilo weight of the dog will reduce the heart rate 20 per cent in from thirty to sixty minutes.

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PRODUCTION OF OIL OF PEPPERMINT.*

BY G. A. RUSSELL.[1]

INTRODUCTION.

The production of oil of peppermint is not confined to any one particular country. Its production is, however, fairly well confined to the Northern Hemisphere. As far as I am aware, no peppermint is produced commercially south of the equator. The chief countries of production are the United States, England, France and Italy. Some oil is produced in Germany and Russia and small plantings are to be found in practically all countries. Australia recently has been experimenting somewhat extensively and intensively in the production of oil of peppermint and the published reports indicate very favorable results.

It must be understood that in this discussion reference is made only to the oil of peppermint from *Mentha piperita*. The so-called Japanese peppermint oil is obtained from *Mentha arvensis;* and is recognized in this country under the common name "Corn Mint Oil." Its production runs into hundreds of thousands of pounds and is of sufficient interest to warrant special attention. This paper does not consider Japanese corn mint oil but is confined to peppermint oil as we know and understand it.

The botany of peppermint is somewhat complicated. Suffice it to state here that the main source of the oil is from *Mentha piperita* var. *officinalis*. Of this species there are many modifications, chief of which are the so-called "black" and "white" mints. The "black" mint is the form most extensively cultivated since it yields more oil than the "white" although the quality is not so good.

The world production of peppermint oil, not including Japan, is in the neighborhood of 500,000 to 600,000 pounds, of which the United States produces the major portion. Next to Japan we are the largest producers of mint oil of any description; this paper is confined to the home activities.

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* Presented before University of North Carolina Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION.

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PRODUCTION IN THE UNITED STATES.

The cultivation of peppermint was introduced into our country by way of the New England States. Some time previous to 1816 the industry was established in Wayne County, New York. At about the period from 1816 until 1889, a period of almost seventy-five years, the industry prospered. The area under cultivation during this period was said to exceed 3500 acres. From 1889 on, the cultivation of peppermint in Wayne County gradually decreased until at present there are very few acres under cultivation in that section.

The industry gradually moved westward extending first into western Ohio and later into Michigan. In 1836 the cultivation of peppermint was begun on White Pigeon Prairie, St. Josephs County, Michigan. This venture failed in a financial way. The industry was revived in 1842 in the township of Florence and from then it was developed into one of the routine farm crops.

About 1875, mint growing on muck land came into vogue and to-day one seldom finds the plant being cultivated on upland in either Michigan or Indiana. Within the past few years the cultivation of peppermint has reached the Pacific coast so that now in Oregon several thousand pounds of oil are produced annually. In your own State of North Carolina, near Elizabethtown, there exists a small planting of peppermint which is said to be producing a large volume of oil per acre of a very good quality. We may look for expansion of the acreage in this section of the State when the value of the crop is fully demonstrated.

CULTIVATION.

The cultivation of peppermint is not difficult, and requires only the usual attention given such crops as corn, potatoes, etc. The methods of planting, cultivating, harvesting and distilling have been worked out through years of trial and experiment.

Muck soil to be planted in peppermint is best plowed in the fall. The following spring the soil is thoroughly disced, usually both ways, then harrowed and well dragged down. It is then thoroughly packed with a heavy roller. This treatment leaves the soil in excellent condition to receive the planting stock.

The roots and runners which constitute the planting stock are dropped in freshly made trenches which have been opened up by any convenient method suitable to the area under cultivation. These roots, which may come from old plantings or from plants grown for the purpose on highland, are distributed by hand in the trench and immediately covered with soil. The planter carries a sack of roots over his shoulder and, as he walks along, drops the roots in the trench so as to form a continuous row. He also scrapes the soil into the trench over the roots with his foot. One acre planted by this method is considered a day's work. After planting, the field is dragged over to level it off and also to finish covering the roots thoroughly.

Within a few days after planting, the field is cultivated with a spike tooth harrow or with a weeder, no attempt being made to follow the rows but rather the cultivating is done in all directions. This treatment destroys the young weeds and keeps the surface of the soil well stirred. When the plants attain a size of about three to five inches, the young mint is then cultivated in the row,

and this cultivation is kept up until the growth of the plants is such that "runners" begin to fill the space between the rows.

Hand weeding is necessary in addition to thorough cultivation. This weeding is especially desirable and necessary just before harvest for weeds not only interfere with the growth of the mint but, when distilled with it, impart to the oil a disagreeable and undesirable odor and flavor. Many of the more common weeds found on muck soils contain volatile oils, and the careful grower always keeps his fields clean of weeds in order to insure a good quality of mint oil.

Peppermint is harvested when the plants have just reached the stage when flowers begin to open, in other words, in the late bud stage. This stage of growth varies with the locality and with the age of the plantation, mint two or three years old comes into bud earlier than one year plants. It is frequently cut with a scythe, especially when the crop is exceedingly heavy in the first year, but more often with a mower. The cut herb is allowed to lie in the swath for about one day, and is then raked with a side delivery rake and bunched with a fork to facilitate handling. It is then loaded on hayracks, and taken to the still where the oil is removed by distilling with steam.

DISTILLATION.

The process of distillation is simple. The partially dried herb is packed in a steam tight retort, known locally as a "tub," and steam is then passed through the herb and carries the oil with it into a condenser where both are condensed. The oil being lighter than water floats on the latter and is withdrawn from time to time and packed in iron drums or cans. This constitutes the "natural" oil of the trade. If subjected to redistillation the product is called, once, twice or triple-distilled, as the case may be and these oils are usually of U. S. P. quality.

Distillation is a physical process. Being the nearest to a chemical process, however, in the production of oil of peppermint, it should be briefly explained. In this process we have the phenomenon of a substance having a boiling point considerably higher than water being taken from a plant by the use of steam. The reason this is possible is due to the vapor pressure. From your knowledge of vapor pressure it is clear that when a liquid is boiling it has a vapor pressure slightly greater than the pressure of the atmosphere in contact with it. If then we have a system containing two immiscible liquids, such as oil and water, each will exert a vapor pressure dependent upon the temperature.

The vapor pressure of any volatile oil will vary throughout a wide range, owing to the various components that constitute the oil. Hence, we can call the vapor pressure of water P_1, and the vapor pressure of the oil P_2. The vapor pressure of the system will then be $P = P_1 + P_2$, where P is the total vapor pressure. Boiling will, therefore, commence when the vapor pressure of the mixture becomes slightly greater than the pressure of the atmosphere in contact with it. The result is that the mixture of water and oil boils at a lower temperature than would either if distilled separately.

COSTS AND RETURNS PER ACRE.

The costs of producing peppermint oil have been estimated by various investigators. The Federal Department of Agriculture has estimated the cost at

$55.00 per acre for the first year and $30.00 per acre for the subsequent years of the plantation. This cost is, in all probability, a good average but extreme yearly variations, mostly upward, may be expected.

Some comparative costs of production have been worked out and these it is believed will give a better idea of the labor and money involved.

GROSS COST OF PRODUCTION.

Crop.	Days of labor, man.	Per acre, horse.
Peppermint	8	4
Potatoes	9	7
Celery	375	18
Onions	32	4

GROSS VALUE PRODUCED.

Crop.	Per acre.	Per day of man labor.
Peppermint	$64.70	$8.09
Potatoes	35.97	4.00
Celery	161.52	4.31
Onions	176.82	5.83

It will be seen from these tables that in comparison with other muck land crops, peppermint occupies a good position. It can be fairly compared in returns of man labor with intensive crops such as celery, onions and potatoes, but it cannot be compared in fairness with corn, oats, rye, wheat and hay.

The figures here given show only a comparison among themselves. These figures are averages for a number of muck farms and are for the year 1914, none being available for a later date. However, by substituting present-day gross values the per acre and per day gross values can be obtained. If such a substitution is made, it must be borne in mind that it applies only to the individual case under consideration unless an average substitution figure is employed.

The returns per acre are variable, running from a few pounds of oil per acre to 60 pounds per acre. The average price for peppermint oil is steadily on the increase, which increase probably takes care of the increase in labor charges. The average prices paid distributors for a period of years are as follows:

From 1895 to 1904, inclusive	$1.23 per pound
From 1905 to 1914, inclusive	1.94 per pound
From 1915 to 1924, inclusive	3.02 per pound

USES.

Peppermint oil finds its greatest use as a flavor in confections and dentifrices. Hundreds of thousands of pounds are used in this manner each year. Pharmaceutically, it is dispensed to some extent in the treatment of colic, nausea and vomiting. It is quite often used to disguise ill-smelling or ill-tasting drugs. It possesses stimulant, carminative and anodyne properties.

CONCLUSION.

In all types of farming there is a great element of risk. This is due to a variety of causes such as fluctuations in prices, variations in yields and unfavorable climatic conditions. The element of risk is high in intensive types, such as peppermint farming. This element of risk is well recognized by all farmers, and most farmers realize that a high yield of oil means a lower price and *vice versa*. This season as well as last the crop has been short and the price high. However, the immediate benefit to the actual producer of mint oil is somewhat doubtful. Taken throughout a period of years, the mint farmer's income from his crop averages as high, if not higher, than most other intensively grown crops.

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WHAT MEANS CAN BE FORMULATED FOR HASTENING THE ENACTMENT OF NATION-WIDE PREREQUISITE LAWS?*

BY LEO G. PENN.

In a recent article by J. G. Beard, on Education and Legislation, appearing in the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, Professor Beard raises the following important and interesting question and suggestion:

"What means can be formulated for hastening the enactment of nation-wide prerequisite laws? Heretofore this has been a problem left largely to each State for solution, when in reality it should have a central direction."

By nation-wide "Prerequisite Laws," I take it that Professor Beard means *uniform* prerequisite laws. I take it also, that the suggestion made by him after the question raised is, that the matter of legislation be taken from the States and placed in the hands of some other legislative body and, as the only other legislative body in addition to the legislatures of the various States is Congress, I take it that the "central direction," which is suggested implies the United States Congress.

For the purpose of this article, therefore, I will assume that uniform prerequisite laws are desirable and I will concern myself with the means whereby they can be obtained.

It is true that the matter of prerequisites, having been left to the several States, has resulted in a very uneven standard of excellence; in the 48 States, there are almost as many varieties of preliminary requirements.

When a young man has satisfactorily completed his college course and passed the requirements of the State Board in one of the States, is it not merely logical that he should be enabled to practice in the capacity of pharmacist in any of the other States by passing a required State Board examination? Yes, you answer, if his preparation for the profession is equal to that of students in the other States.

Under existing conditions, it most assuredly is not. For illustration:

Some States provide as their only stipulation that candidates for the profession pass the State Board. They do not question how or where the necessary knowledge has been obtained, nor do they concern themselves with the preliminary training a man has received.

Pennsylvania, on the other hand, does not merely insist upon the successful completion of a college course, but demands a four-year high school course in order that the members of the profession may have some cultural and intellectual training. These are only two examples, but the preliminary requirements range through all degrees from the slightest and most negligent to the highest yet required. I am not pleading here for an increase in prerequisites, but surely it is obvious that the more carefully the requirements are looked into and the sounder the

* Section on Education and Legislation, Des Moines meeting, 1926.

preliminary training, the better will be the status of men entering the profession and, in times when the spirit of gain is so predominant, we could well profit by a more select group of men. However, no matter what the preliminary requirements decided upon, the vitally important thing is that all of those requirements, throughout all the states, be *absolutely uniform*.

Then the question arises as to how we are to achieve this state of uniformity? The mind of one not learned in the law naturally offers the solution that if we desire to have uniformity all over the United States, then let the Congress of the United States enact a nation-wide law.

Unfortunately for this argument, though perhaps fortunately for our scheme of government, there are limits to the law-making powers of Congress. Under the Constitution of the United States, Congress may pass only such laws as are in pursuance of the powers given to it by the Constitution.

On the other hand, the individual State may pass any law, except such as it is forbidden to pass by its own constitution and the Constitution of the United States.

In other words, if we wish to know if Congress may pass a certain law, we look to see if the Constitution of the United States permits it to pass that law. If we wish to know whether a State can pass a law, we look to see if its own Constitution or the Constitution of the United States forbids it from passing the law.

It would, therefore, seem to follow, that the enactment of a uniform Prerequisite Act by Congress is impossible. Such legislation has nothing to do with any power given to Congress by the Constitution of the United States, and would therefore be unconstitutional. The United States Congress being eliminated, the only other law-making bodies left for that purpose are the Legislatures of the several states.

The next question that is therefore raised, is: "Is it impossible to secure uniform prerequisite laws because such action is left to the several States?"

The suggestion by Professor Beard seems to indicate that unless it is taken away from the several states, there can be no solution. However, this does by no means follow.

Those who have been subjected to the greatest inconvenience by reason of the diversity of laws have been the lawyers. To overcome this great source of annoyance, they have organized a commission for the purpose of securing uniform state laws on matters where uniformity is desirable.

This commission has drafted a considerable number of uniform laws which it has through its efforts succeeded in having numerous states pass. Thus, 41 states have adopted a uniform Negotiable Instrument Act, 48 have adopted the Uniform Warehouse Receipts Act, 26 have adopted the Uniform Bills of Lading Act, 16 have adopted a Uniform Partnership Act, 27 have adopted a Uniform Sales Act, and 18 States have adopted a Uniform Desertion and Non-Support Act. Such a commission has proved itself to be an invaluable aid to the lawyers. Could not, then, the pharmacists utilize some such plan in this problem?

To me, it seems that the State Boards of the various States which represent the legal side of the profession are most fully equipped to do so.

The plan that I would suggest is very simple. Let interest be aroused throughout the State Boards on this question of uniform prerequisites.

Then, what the Lawyer's Commission has done for their profession, a commission formed by the State Boards would do for our profession. In their hands would be the necessity of meeting, discussing this problem and coming to a satisfactory conclusion.

If the ground already has been broken for passing uniform State laws, as I have above indicated, there is no reason why we cannot have uniform prerequisite laws.

Therefore, my suggestion is:

First: Let the National Association of Boards of Pharmacy through the State Boards and the AMERICAN PHARMACEUTICAL ASSOCIATION agree upon a law. Second: let this influence cause a uniform law to be adopted by all the States. Third: Secure in the knowledge of uniform purpose, for with unity there comes strength, this movement can be carried to the central government for the enactment of a national law.

THE OLD-TIME DRUG STORE.*

BY JOHN W. BALLARD.

May 6, 1865, I walked into a drug store located at 106 West Second Street, Davenport, Iowa. For fifty-five years after that date I was in that one location either as apprentice, clerk or proprietor.

It was a real drug store. Paints and oils were the only side line. It did not resemble the present-day drug store. On the lower shelf of the first section were one-gallon tincture bottles. In these were tincture of arnica, gentian compound, Huxham's tincture, and other popular articles.

On the second shelf one-half gallon bottles in which were kept the aromatic waters; spirit of nitre, spirit of lavender, etc. On the third shelf, quart tinctures, in which were the remainder of the pharmacopœial tinctures from *Aconitum* to *Zingiberis*. The bottom shelf of the second section was given to specie jars; there were quite a number of two-gallon jars in which were kept some of the most frequently called for herbs: Senna, buchu leaves, uva ursi, etc.

On the second shelf were also half-gallon bottles in which were aloes, hiera picra, roots, barks, etc., and quarts occupied the third and top shelves. The bottle labels were of gilded paper, as the glass labels had not then appeared.

All tinctures, syrups, etc., were manufactured in the store and these from the whole roots and barks, so that Swift's drug mill and the big iron mortar were in frequent use by the apprentice. The first "ready to wear" remedy prescribed by physicians was the "Elixir Cort. Peruv. cum Ferri Protox," made by J. R. Nichols & Co., Boston.

A well-arranged prescription case was on the rear counter where the most used powders, extracts, etc., were kept. Blue mass, extracts of nux vomica, gentian, dandelion, etc., were prominent, and Dover's Powder, tartar emetic, lead acetate, etc., were conveniently at hand.

We had a fairly good prescription trade. In those days prescriptions were really compounded, for physicians prescribed the officials instead of proprietary

* Section on Historical Pharmacy, A. PH. A., Des Moines meeting, 1925.

compounds. Sugar-coated pills had not appeared and every prescription for pills had to be made to order, except compound cathartic pills and rhubarb compound, which were kept in stock, and these uncoated.

Plasters? Yes, every one made to order from Burgundy pitch, medicated with belladonna, arnica, camphor, etc., and also emplastrum cantharidis in various shapes and sizes.

The prescription clerk was also the night clerk and had a modest room in the rear of the store or a room upstairs, and many were the calls he had to answer. Physicians carried only a small pocket case, and many prescriptions were sent in at night. Steamboating was then popular on the Mississippi River and the deck hands often had discussions which ended in seeking first aid at the drug store and the sleepy night clerk had to respond.

The convenient package dyes had not appeared, but the good housewife was just as anxious to renovate an old garment then as now, and the efficient salesman had to know the suitable dyes and mordants to use to produce the desired color. Barrels of logwood, fustic, nicwood and camwood were stored in the basement and were quite an item in the business.

Chicago and St. Louis were convenient sources of supply, but we relied largely on New York. Heavy goods, such as brimstone, copperas, blue vitriol were sent by Erie canal and then by steam around the lakes, requiring about six weeks, but at a low freight rate. Pittsburgh was the headquarters for bottles and these came by boat down the Ohio River, then up the Mississippi.

The country was new; horses were overworked and badly fed and then given condition powders, which were fearfully compounded from sulphur, black antimony, asafetida, and foenugreek—sometimes they endured the treatment but failures were frequent.

Cosmetics? Yes, the young ladies dolled up then as now, but their armamentarium was confined to a cake of magnesium carbonate, drop chalk and carmine; the boys used beaver oil to keep their hair shining and slick.

Instead of the tiny pink pills now largely dispensed on Saturday, senna and manna, hiera picra, rhubarb and magnesia, were quite popular with the working classes.

The Labor Unions did not function in those days. The Junior opened the store at six o'clock in summer and seven in winter; his day ended anywhere from eight to ten o'clock in the evening. But with all the time and labor required to be an old-time druggist, I always loved the business and finally graduated from the New York College of Pharmacy in 1876, of which institution only one living graduate is my senior.[1]

SANTONIN AS A DAILY DOSE.

Evidently Russian manufacturers of Santonin are endeavoring to promote the use of this generally. L. Gildesgame, Managing Director for the Eastern & Russian Trading Co. Ltd., London, states that in Japan all confections, pastry products, mineral waters, tonics and many medicinal products, include a portion of santonin as a part of a government-supported drive to eradicate human intestinal parasites. Evidently, the purpose of his visit was partly, at least, to extend the use of santonin in this country. According to his statement exports to Japan are five tons a year; and to the United States, three tons annually.

[1] Mr. Ballard died June 8; see notice under "Obituary;" this number.

DEPARTMENT OF BUSINESS MANAGEMENT

Conducted by Paul C. Olsen.*

COMMENTS, QUESTIONS AND SUGGESTIONS ARE INVITED AND WELCOME.

Readers are invited to submit comments, criticisms and suggestions regarding the material which appears in this department. The Editor also will undertake to answer questions regarding general problems of business management. Letters of general interest will be published, but the writer's name will not be revealed without his permission.

WHEN SHALL WE CLOSE THIS SUMMER?

"Closed Wednesday afternoons and evenings during the summer." Thus read the sign on the locked door of Bennett's Modern Pharmacy.

"Oh, dear," sighed Mrs. Austin, "I never can remember when these drug stores are open in the summer time. Over in Amblton they close Tuesday and Thursday evenings. Well, I guess I'll go down to the news stand. I hate to buy a tooth brush there but I do know they're always open."

Mrs. Austin was but one of dozens of women who stopped at Bennett's Modern Pharmacy on Wednesday afternoons during the summer, tried the locked door and went away disappointed.

Mr. Bennett's friends sometimes asked him if he did not lose some business by his afternoon closing.

"How can I?" he always replied, "Every other druggist in town is closed. A druggist gets precious little time to himself. Closing Wednesday afternoons and evenings is certainly not much of an inconvenience to anybody. A man has a right to that much time off."

Mr. Bennett is right. No one should begrudge the druggist a holiday. On the other hand, when and how the holiday is to be taken is a matter calling for nice judgment.

In Mr. Bennett's case, for instance, it is easy to see that customers who have every intention of buying from him are being driven to his competitors by Wednesday closing; not to competing drug stores, to be sure, but to even more aggressive competitors; to the news stands, the stationery stores, the department stores, the five-and-ten-cent stores, the ice cream stands and the host of others that sell some of the lines ordinarily carried in drug stores.

Any merchant knows that it is easier to keep a customer than it is to win him back after he has left. Also the shrewd merchant knows that it is easier to hold old customers than it is to attract new ones. Any policy which drives customers away is therefore detrimental.

There is another aspect of the problem. No one seems yet to have determined the ideal hours for summer-time closing. Sometimes it is one or two or more even-

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ings a week. In other cases afternoons are chosen. The practice varies not only from city to city but in different parts of the same city. It also varies with different kinds of stores.

The result is a great confusion in people's minds. In fact, in sections in which evening closing is the vogue, merchants report that the tendency is to reduce considerably their business on the nights they are open, a result undoubtedly of the confusion of closing hours.

The object of this article is not to decry summer closing hours. The purpose is to emphasize the fact that closing hours must be chosen with great care in order to avoid serious and oftentimes permanent losses of business. The problem is individual because conditions vary with each store.

That is the weakness of agreements among stores all to close at given hours. The druggist in the down-town financial district who does practically no business after 6 o'clock is naturally willing to close every night at 9 o'clock. On the other hand there are numerous instances of stores which do 90 per cent of their business after 6 o'clock at night.

Many stores have found it advantageous to close Sunday afternoons because they have learned that they can do practically no business during the hours they now keep their stores closed.

Some druggists become alarmed when they find their nearby competitors staying open late at night when they have always closed earlier. There is no advantage in keeping open late just because a competitor does, unless enough business results to justify it. If the business is not there, the competitor is not taking anything away from the store which does not stay open.

In the case of many stores in busy sections the solution of the closing hour problem lies not in closing the entire store at one time, but in giving each employee the equivalent time on different days during the week. This is usually possible in even the smallest stores by the use of a relief clerk or assistant.

The thing to recognize is that opening and closing hours constitute a problem of the individual store and should be decided upon accordingly.

FIVE PROVED PLANS FOR INCREASING PROFITS IN SUMMER TIME.

NO. 1. KEEP THE STORE COOL.

This is especially important in a store which expects a large soda fountain business. No one likes to go into a store which is uncomfortably warm. Customers and clerks both become touchy and disagreeable in a warm store. On the contrary, a store which is refreshingly cool invites the customer to linger and gives the displays a chance to suggest other purchases. People in the store also have more enthusiasm and zest for their work.

Awnings, dimmed lights, summer colors (greens and blues) help to give the illusion of coolness. Electrical supply houses can recommend where to place electric fans to secure the most benefit. They also can advise about the use of exhaust fans. Glaring, low-hung lights should not be used, especially in daylight hours. Heavy draperies suggest warmth and any of these therefore should be

banished for the summer months. In some stores gay colored cretonne chair covers have proved effective at the soda fountain tables.

NO. 2. FEATURE WEEK-END AND VACATION SPECIALS.

One druggist adds over $50 every Friday and Saturday to his boxed candy business. On those two days he simply makes a special display of high-grade candy, both in the window and in the store. The same thing can be done with tobaccos and many other items. This is the idea used the year around by successful drug and cigar chains. Located as they are, principally in the downtown sections of large cities, Sunday is a dull day for them. They attempt to sell to their customers their Sunday supply of candies, tobaccos and other goods by offering special inducements for their purchase on Friday or Saturday. Druggists have proved time and again that the mere display of an article is sufficient to increase its sale without the inducement of a cut-price appeal.

It goes without saying that as the vacation season begins the city druggist should constantly feature an ever-changing variety of vacation needs. This merchandise is thus brought to the attention of his customers at the time they are most in need of it and he accordingly has a good opportunity to make the sale. For instance, all bathing caps are not bought at the seashore.

NO. 3. ADVERTISE MAIL ORDER AND DELIVERY SERVICE.

Many people are glad to know that, wherever they go, their favorite druggist will fill their prescriptions and supply their other drug needs. Sales of this kind naturally represent more trouble than over-the-counter business, but it should be remembered that the good will engendered by such service extends to a great many other purchases the customer makes when at home. It is one of the things that helps to make life-long customers.

Customers can be reminded of this service by tactful suggestions in personal conversations, and by blotters and other announcements mailed with monthly statements or inclosed in packages.

NO. 4. SUMMER HOUSECLEANING.

In stores which fill large numbers of prescriptions, summer is the time when business is less active. Accordingly it is an excellent time to install improvements, large and small, which if attempted in the winter would only disorganize business. Perhaps a few changes or additions would greatly enlarge prescription-room shelf space. If an up-to-date index of prescription room items is not maintained, summer is a good time to start one. Sometimes a systematic rearrangement of shelf bottles and other items will make them more accessible and consequently quicker to find and use when prescription activities are brisk. If an old-fashioned prescription filing system is used much valuable time is lost when prescriptions are to be refilled. Summer is a good time to start a modern prescription file.

These activities have no direct bearing on summer profits but they have some very important indirect benefits. In busy prescription stores valuable employees often have to be retained through the summer although there is not always enough for them to do. Improvements in prescription room methods afford them a use-

ful occupation. Any employee who is worth having at all would rather be occupied this way than sitting around waiting for something to happen.

Worth-while improvements, moreover, so improve the store service at busy times that they pay for themselves many times over.

NO. 5. ATTRACT AUTOMOBILE TRAVELERS.

Summer is the time when people travel most for pleasure. More automobiles are on the road, and people pleasure-bent are liberal spenders. The roadside stand obtains much of the business which otherwise would go to established stores. Therefore the stores that want the business must seek it aggressively. Signs, along traveled roads near the store, have proved effective for well-located stores. These signs should be large enough and brief enough to be read easily from a rapidly-moving automobile. This means that the wording to be effective must be definite and explicit.

Drugs—Soda—Films
On the left
200 feet ahead
Conner's Drug Store.

3 miles to Toptown
and Marcum's Drug Store
Opposite Court House.

Wright's Drug Store
Right Around the Corner.

Easton's Drug Store
Turn Here.

Signs such as "Slow down to Blank's Drug Store" not only stir up ill-feeling but are actually forbidden in some localities as a menace to safety. Signs thoughtlessly placed also have exactly the opposite to the intended effect. Anyone should know, for instance, that it is a mistake to put an advertising sign on a beautiful shade tree. Signs should never be placed on private property without the consent of the owner. Regulations regarding placing signs on public property should be carefully observed.

Above all things, the purpose for which the signs are put up should not be forgotten. That purpose is to attract people to the store. From all approaches the store should be instantly recognizable as a drug store and the drug store to which the signs direct. This means an attractive front at all times, neat well-decorated windows and well-conceived signs on the store itself which identify it as the one advertised. This first appearance should reflect the character of the store itself, as well as serve as a means of identification.

SEASONABLE DISPLAYS FOR JULY AND AUGUST.

Cameras and photographic supplies
Film developing, printing, enlarging
Vacuum bottles
First aid kits
Mosquito and ivy poison remedies
Sunburn remedies
Talcum powder
Insecticides
Sponges and chamois
Bath requisites
Bathing caps and supplies
Soda fountain
Ice cream and bottled soft drinks

THE DEPARTMENT OF THE NATIONAL ASSOCIATION OF BOARDS OF PHARMACY

M. N. Ford, President, Columbus, Ohio. J. W. Gayle, Treasurer, Frankfort, Ky. Edw. H. Walsdorf, Chairman of Executive Committee, New Orleans, La. H. C. Christensen, Secretary, 130 N. Wells St., Chicago, Ill.

ACTIVE MEMBER STATES.

Alabama	Iowa	Montana	South Carolina
Arizona	Kansas	Nebraska	South Dakota
Arkansas	Kentucky	Nevada	Tennessee
Colorado	Louisiana	New Hampshire	Texas
Connecticut	Maine	New Mexico	Utah
Delaware	Maryland	North Carolina	Vermont
D. of Columbia	Massachusetts	North Dakota	Virginia
Florida	Michigan	Ohio	Washington
Georgia	Minnesota	Oklahoma	West Virginia
Idaho	Mississippi	Oregon	Wisconsin
Illinois	Missouri	Pennsylvania	Wyoming
Indiana			

TWENTY-THIRD ANNUAL CONVENTION OF THE NATIONAL ASSOCIATION OF BOARDS OF PHARMACY, PHILADELPHIA, PA.

Monday and Tuesday, September 13 and 14, 1926.

This is to be a busy and interesting convention, and it is urged that every state send a goodly representation, as several of the propositions to be discussed are very important ones and require consideration and action by all.

The N. A. B. P. Convention will be followed by the convention of the AMERICAN PHARMACEUTICAL ASSOCIATION, which will continue throughout the week, and the week following the N. A. R. D. Convention is to be held, also in Philadelphia. This is an ideal arrangement as many delegates are interested in more than just one of the conventions and can arrange conveniently to attend all, if desired. Headquarters will be the Bellevue-Stratford Hotel, and reservations should be made early.

There will be a Joint Session with the American Association of Colleges of Pharmacy. Now that the three-year course is an accomplished fact, it is necessary to settle upon the minimum standard of requirements, and both the Boards and the Colleges need and invite your attendance.

A complete tentative program of the meetings of the AMERICAN PHARMACEUTICAL ASSOCIATION and its associate bodies is given under "Association Business" in this number, but for your convenience we are listing the N. A. B. P. meetings in this Department.

Monday, September 13—	9:00 A.M.	Meeting of the N. A. B. P.
	2:00 P.M.	Meeting of the N. A. B. P.
	8:00 P.M.	Meeting of the N. A. B. P.
Tuesday, September 14—	9:00 A.M.	Joint Session, N. A. B. P. and A. A. C. P.
	2:00 P.M.	Meeting of the N. A. B. P.

Since "all work and no play" has never been a good program, the play has not been omitted. An all-day trip to the Sesqui-Centennial International Exposition has been planned for Saturday, September 18. There will be dinners, luncheons, receptions and dances interspersed between the various meetings to give you "pep." And don't forget to bring the ladies—a special entertainment feature has been planned for them for each day. They will be kept busy and happy while you attend the meetings.—H. C. CHRISTENSEN, Editor.

FRAUD EXPOSURE IN TEXAS EXAMINATION.

To the Boards of the United States of America:

"At a meeting of the Texas Board of Pharmacy held in the City of San Antonio on the 20th day of January 1926, it was discovered that fraud was being practiced. On further investigation, it was found that one H. D. Crowe was writing answers to questions for two other applicants, said applicants being Ed. A. Robinson and H. S. Scarborough. This discovery was made too late legally to handle the participants in the fraud.

"At a meeting held May 18th in the City of Galveston, H. D. Crowe again presented himself for examination. At this meeting, H. S. Scarborough was not present, but Ed. A. Robinson was present and H. D. Crowe was writing his answers. The District Attorney's office was consulted and a warrant sworn out for the arrest of said H. D. Crowe. On account of the dilatory tactics practiced by the sheriff's office, H. D. Crowe escaped. Ed. A. Robinson was called before the Board in executive session, and a sworn confession, signed and witnessed, was obtained from him.

"The confession was to the effect that Robinson and Scarborough had hired Crowe to take the examination for them in San Antonio and that they were to pay his expenses from New Orleans and a fee of $200.00 if he succeeded in passing the examination. Not having passed the examination in San Antonio, he came to the meeting held later in Galveston for the purpose of attempting to secure registration for Ed. A. Robinson. The Board also procured sworn statements from L. M. Waggoner and J. F. Doolin that H. D. Crowe had offered to take the examination for them, and that they saw H. D. Crowe exchange papers with Ed. A. Robinson. These sworn statements are on file in the offices of the Texas Board of Pharmacy in the City of Dallas.

"Therefore: We hereby request that if any board of pharmacy to which this may come, has issued registration to Henry Dewey Crowe, Ed. A. Robinson or H. S. Scarborough, that such board immediately revoke such registration and that examination be refused the above persons for all time to come. This notification is on the order of the Texas Board of Pharmacy in executive session assembled in the City of Galveston, on the 18th day of May 1926.

"The Texas Board of Pharmacy is under obligations to J. F. Doolin and L. M. Waggoner for assistance rendered in the investigation of the fraud and their voluntary sworn statements.

"Given under my hand and seal of office this the 25th day of May 1926, at Dallas, Tex."

(Signed) W. H. COUSINS, *Secretary*,
Texas Board of Pharmacy.

CALIFORNIA PLANS PREREQUISITE LEGISLATION.

John Culley, *Chairman* of the N. A. B. P. Legislative Committee and Arthur G. Hulett, Phoenix, Arizona, N. A. B. P. *Vice-President* and *Chairman* of District No. 9, who represented the N. A. B. P. at the California State Pharmaceutical Convention held at Long Beach, May 24 to 27 inclusive, reported to the N. A. B. P. Secretary's office that the meeting was an "unusually" successful one.

Frank Mortenson, a former President of the N. A. B. P., now conducting a successful drug business at Hollywood, California, and active in the Association, was appointed one of seven members constituting a Legislative Committee to handle propositions to be brought before the next session of the California State Legislature. Although the Legislature will not meet again until January 1928, this Committee expects to be active. A tentative new pharmacy bill, or suitable amendments to the present law, will be drafted by this committee and presented to the state meeting next year, when any differences which may arise are to be reconciled. It is expected in this way to go before the Legislature with a bill which will have the solid backing of the pharmacists of California.

One of the provisions of such a bill will be to require graduation from a school or college of pharmacy for entrance to examination and registration as pharmacist.

It is also expected that the new proposed bill will include other progressive features which will introduce California as another state into the ranks of the majority column by bringing the provisional features of its law into harmony with those of the states already in this division.

NEW RECIPROCITY RULING EFFECTIVE IN FLORIDA.

At the meeting of the Florida Board of Pharmacy held on June 12th, the following resolutions were unanimously adopted:

> No. 1. "Any person applying for reciprocity in the State of Florida from another State must have practiced his profession for a period of not less than five years after registration as a Pharmacist, in some State or States other than Florida, before he will be eligible to registration in Florida by reciprocity."
>
> No. 2. "All registered Pharmacists eligible to reciprocity, coming into this State and actively engaging in the practice of Pharmacy must make immediate application for registration and appear before the Board within twelve months. Unless so doing no application for registration by reciprocity will be considered under any circumstances."

The examination meeting of the Board was held on June 15, 17 and 18. The first day of the meeting was spent in passing on applications of 200 candidates for reciprocal registration, and the last two days in examining 60 candidates for registration by examination.

RHODE ISLAND LICENSE LAW.

A drug-store registration and license law was passed at the last session of the Rhode Island Legislature, making it unlawful to operate a pharmacy or drug store after July 1, 1926, without a license from the Board. The license fee is $5.00.

No license will be issued until the Board has found the applicant legally entitled to hold such a license. Ample provision has been made for licensing all pharmacies before July 1, and the management of each store is to be held responsible for compliance with the law before that date.

GENERAL NEWS ITEMS.

George Judisch, of Ames, a member of the Iowa Board and Past-President of the Iowa State Pharmaceutical Association, had a well-deserved honor bestowed upon him on May 28, 1926. The Iowa State College of Agriculture and Mechanical Arts presented him with a Certificate for Distinguished Services as a testimonial from his colleagues of their high regard of his services as a professor for the past quarter of a century and "with the hope that he may long continue to serve the cause of education." Only eight such certificates are in existence, and we congratulate Mr. Judisch knowing that he merits the honor, as he has done much for the advancement of pharmacy, not only in Iowa but in the whole country.

Alf Walker, Secretary of the West Virginia Board, has been suffering with ill health most of the winter, but we are glad to learn that he is again back at his post of duty and feeling better.

THE CENTENNIAL OF CHEMISTRY.

The group shown in this picture attended the memorial meeting in Northumberland, Pa., at the grave of Priestley, the discoverer of oxygen. There are a number of pharmacists in the picture. B. G. Amend, Prof. J. M. Maisch, Dr. Fr. Hoffmann and Prof. P. W. Bedford are in the center. Prof. J. P. Remington is standing against the building at the right; Dr. Charles F. Chandler is the seventh from the left in the second row.

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

THE LURE OF RESEARCH.

BY ZADA M. COOPER.*

Under the title, "The Lure of Research," Professor Nutting, head of the Department of Zoölogy of the State University of Iowa, has written a splendid little article. The language is beautiful and it makes an alluring picture of the fascination there is in searching for the unknown. It would do every real pharmacist good to read the article in its entirety but, brief as it is, it is too long to reprint in these columns. Professor Nutting's own life is a splendid illustration of what may be accomplished if one is imbued with the spirit of discovery. Speaking of him, one of his colleagues has said "By many years' work in this little inland town more than a thousand miles from the nearest seacoast he has become a distinguished authority on a minute species of marine life which few people know exists."

Professor Nutting believes that popular opinion about research is full of misconceptions. "Research," he says, "is not a sort of highbrow pose which gives an air of superior learning, a reputation of exceptional scholarship: an effort to belong to a superior caste in the estimation of the world, to occupy the spotlight on the stage. This sort of incentive marks not the real but the pseudo research men or women, and lacks the ring of pure coin.

"To my mind the research spirit is not found either in those who seek professional profit or those whose objective is intellectual reputation. It is a far better and deeper thing; an impulse that has done more, perhaps, than any other to advance civilization and the ascent of humanity.

"The true research worker is of the calibre of the pioneer, and he feels that same lure, the same fascination, that impels him to advance the frontier of knowledge in any direction which may be open to him on earth, in the heavens, or in the depths of the sea. He is seeking primarily neither fame nor fortune, but his aim is always to penetrate a little further into the unknown than have his forbears or companions; to advance the frontiers of knowledge, if ever so little, and leave the reaping of the harvest to those who come after him and succeed in using his discoveries to the betterment of mankind in what we know as 'Applied Science.'

"The best research men that I have known have always had this spirit of the intellectual pioneer and never have they seemed to be impelled primarily by the desire for advancement or financial gain. The lure is forward and beyond the borderland of knowledge and this spirit actually carries them forward into the unknown and it is my belief that it always leads to the discovery of new things beyond the border.

"It is this urge, constant and insistent, to penetrate into the unknown and push its borders back at any point, that impelled such men as Daniel Boone and Davy Crockett, Lieutenant Pike and Roald Amundsen to set aside the comforts of life, turn their backs on friends and home, and plunge into the perils of the unknown. It is the lure of the Arctic and Antarctic; of Africa, South America

* University of Iowa.

and the Isles of the Sea. It is the compelling impulse to penetrate the unknown that has cost many a heroic life and will cost many more so long as man is man. It is the pioneer spirit, the divine discontent that ever compels the onward move beyond the frontier, the spirit that enabled our fathers to conquer this continent and make it the land of peace and plenty that we know and love."

The earth still has some unexplored spots to beckon adventurous spirits to hunt out their secrets but the undiscovered in the world of science is infinitely larger. Even in the pharmaceutical world, there are many almost untouched fields. There is not one of us who cannot think of a score of things that need investigation right now. Nor is there anyone who is altogether shut out from the possibility of doing some small bit to add to the sum of pharmaceutical knowledge. The opportunities are all around us if we will only look and think and act on our present knowledge with the tools we have at hand.

I don't know how much the colleges are doing to correct the wrong impressions that exist but it is obviously the duty of those of us who teach to utilize every opportunity to instil into the minds of our students the idea that they should cultivate, not suppress, the desire to investigate and the belief that the will to achieve has more to do with achievement than the possession of a brilliant intellect, a profound knowledge, or expensive apparatus with which to work. Professor Nutting expresses this idea splendidly. "I think there is a feeling among students that the research worker must be a man of exceptional intellectual endowment, a towering mentality, a genius of some sort. This is a mistake, and my experience goes to show that an average intellect plus this eager pioneer spirit, this urge to pass the frontier, is all that is required to make a successful research man or woman. No genius, without that spirit, is apt to attain success, and a fairly mediocre mind, impelled by the incentive and with the powers of concentration and persistence, can often outstrip men of vastly superior mental endowment."

Genius is after all a capacity for taking great pains, it involves great patience, much persistence in the face of discouragement. Prof. Nutting relates an early experience of his own which illustrates, excellently, what I have been trying to say about the possibility of anyone who has the inclination making discoveries of his own. "Expensive laboratory equipment, although often highly desirable and sometimes essential in solving certain problems, is not always necessary for good research. I well remember a most profitable summer vacation when I secured my first microscope in payment for renovating a small collection of birds and was eager to put it to practical use. While spending a part of the summer on the farm, I secured the services of a good-natured hen who obligingly furnished numerous eggs for my investigations. These were used to work out the first three days in the embryology of the chick.

"By the use of normal salt solution the germinal part of the egg could be kept alive for a sufficient time to see a number of the most important events in the drama of development actually occurring in the living creature under the lens of the microscope. No motion picture was ever so fascinating as this. Here was the story of evolution actually unfolding itself under my very eyes. It was infinitely more interesting than any series of prepared slides of preserved material could possibly be. Here was seen the gradual deepening of a slight groove which changed to a tube in which the spinal cord and finally the brain took form and developed

in complexity and in orderly fashion. Another tube-like structure bent on itself, grew into two chambers, and these two became divided into four and lo! a heart was formed, pulsating and starting the blood current which would know no rest while the creature lived. Again little knob-like buds appeared, four of them in pairs, gradually unfolding until they took the form of wings and legs. I had read these things but the fascination of seeing them actually taking place was one of the memorable experiences of a lifetime. The satisfaction of independently making these discoveries was real, and far beyond any that could result from reading about them or hearing lecturers telling of them, and the profit to me was as great as if they had been entirely original discoveries. It had all the joy of research and of penetrating beyond the borderland of my previous mental experience. Although this borderland had been crossed by others, I had entered by a trail that was of my own devising and felt the joy of the pioneer."

As pharmacists we should remember, for our own sake, and remember to tell our students of the many pharmacists who have made important discoveries; for instance, that Scheele was an apothecary throughout his entire life: that all his discoveries were made in that little shop, under heavy odds. It is said that he used wooden tubes lined with goose quills and collected gases in bladders, but the discoveries are his and for them he was made a member of the Swedish Academy of Science. Chemists do not forget to record his discoveries. Do we do as well?

French apothecaries have brought much honor to pharmacy. Courtois discovered iodine in the ashes of seaweed and Balard discovered bromine; Parmentier did much research work on belladonna, cinchona and ipecac; Pelletier discovered strychnine and brucine and with Caventou isolated quinine. Sertürner, another pharmacist, discovered morphine and Unverdorben was the first to obtain aniline. All of these men and many others were apothecaries engaged in the regular pharmaceutical work of those days and most of them worked under very great handicaps. In the light of what they accomplished there is no excuse for present-day pharmacists. We who teach are derelict in our duty, too, if we do not put research in its proper place. No student should go out from our class rooms feeling that research takes unusual brains, a peculiar temperament or great wealth. Whatever present opinion about research may be we can do something to mould that of the next generation of pharmacists, if we try.

Prof. Nutting's article deals chiefly with pure science as distinguished from applied science, though he recognizes the place applied science takes in our modern world. "The pursuit of pure science," he says, "seldom yields financial gain such as often rewards those who devote themselves to the field of applied science. To be sure the pure scientist may rightly hope for some advancement in his profession if he is a teacher; but this is, and should be, merely incidental and hardly sufficient to tempt ambitious men and women. But this paper has been written in vain if it has not envisioned a reward far above that of money. It cannot be quoted in the stock market, but it is real, substantial, soul-satisfying—the joy of discovery."

Prof. Nutting will retire from teaching at the end of the present college year in order to devote his entire time to research. We, who know him, know that he is sure to feel the thrills of satisfaction of which he speaks in concluding his article, as we know he must have felt them in the past. "Somehow we think of intellectual pleasure as cold and lacking the glow and tang of emotional satisfaction. But it

is emotion, stirring the soul to its very depths. It is on a higher plane than our ordinary emotions, but all the purer for that; a spiritual exaltation like that on the mountain top with the world at one's feet, where small things are forgotten and big things stand out; a world seen in true perspective. Here is a stupendous enlargement of vision and we see, reaching into the blue serenity of heaven, other peaks to scale, heights seen only from the heights, and we are spurred on by a new ardor, and new inspirations come that point to further and grander achievement, still fuller joy. For no Alexander of the intellectual world will ever weep for new worlds to conquer. They ever stretch beyond the limits of his horizon and the more he achieves the more extensive his vision.

"Here on the heights is a foretaste of immortality, for the peak of his attainment will forever bear his name, a monument more lasting than inscriptions on granite or bronze, lasting as the peak on which he stands.

"The monuments of Rome are crumbling, but the seven hills remain."

Perhaps it is anticlimax to call attention to the two sentences in this article that, to me, stand out above all others: I am not artist enough to know. They are: "For no Alexander of the intellectual world will ever weep for new worlds to conquer" and "The monuments of Rome are crumbling, but the seven hills remain."

THE PROGRESS OF PHARMACY.*

BY C. B. JORDAN.

After introductory remarks relating to his connection with pharmacy, and his devotion to it and faith in the mission of pharmacy, Dean Jordan said:

Pharmacy and Medicine had their beginning in antiquity. As myth tells us, ever since Epimetheus, attracted by the beauty of Pandora, accepted her box as a gift and lifted the lid, hunger and want, sickness and disease have afflicted the world. Fortunately Hope, though injured, escaped along with man's torments and has ever remained to console and comfort him. She was soon represented by the god Aesculapius who taught man the art of healing and thus Pharmacy and Medicine were born.

The early practitioners were both pharmacists and physicians, diagnosing, preparing their drugs and decoctions and administering them. As the art of healing advanced, some went forth to call upon the sick while others remained to prepare the remedies. Thus there began a division of this labor and to the pharmacists fell the duty of collecting, preserving, preparing and dispensing known remedies and developing new ones. These duties they are performing to-day and it is the purpose of pharmaceutical education to prepare young men and women for this important work.

It soon became apparent that one pharmacist could dispense for many physicians and the forerunner of the modern dispensary came into being. Gradually there was added to the pharmacists' duties, the sale of sick-room supplies, household remedies and such personal necessities as toilet articles, soaps, perfumes, cosmetics, etc., and there was developed the modern drug store, a necessity in every community because it renders a service that is both professional and semi-com-

* Address delivered at banquet in honor of the installation of Dr. W. T. Sanger as President of the Medical College of Virginia, June 1, 1926.

mercial, a service that cannot be rendered successfully except by those who are educated and trained for the task.

The past fifty years have chronicled notable achievements in educational professions. We still have with us some of the old family physicians who received only two or three years of collegiate training. Many of them are very successful, but no young man can enter medicine to-day unless he has received a much more comprehensive training. Dentistry has advanced, in a comparatively short length of time, from one year to four years of collegiate training.

Pharmacy has been slower in its educational advancement, due, I believe, to the fact that the pharmacist's attention was divided between scientific and commercial pharmacy. The pharmacist must serve his community in a commercial way as well as professionally. These services, although in a measure dissimilar, are closely correlated and no one can say which is of the greater importance to the people who receive them. A trained mind is necessary for the proper execution of this semi-commercial service, but the training need not be so thorough as that required for safe and successful dispensing of medicinal compounds.

We of the professions of Medicine, Pharmacy, Dentistry and Nursing fully appreciate the responsibilities assumed by those who are charged with the relief and cure of disease. The uninitiated, however, do not appreciate and rarely give a thought to this responsibility. A careless pharmacist may negative the efforts of the most competent and painstaking physician. Even more, they may jeopardize the life of the patient. The same is true of careless physicians, dentists or nurses. Every time you take a prescription to a drug store you are placing your life or the life of others in the care of the pharmacist. The misreading of a prescription or a label, a hand placed upon the wrong container, a mistake in weighing or measuring, may mean suffering and death instead of relief and health. Surely a person who bears such responsibilities, one who holds life or death in the hollow of his hand, must be well trained in order to perform these successfully so that the safety of the patients is assured and public health is safe-guarded. Such a person cannot be too well prepared for these important duties.

All of this is accepted by the public as a matter of course and little or no thought is given to the gravity of the work in charge of the pharmacist. Only when an error occurs is the importance of correct knowledge and painstaking care in compounding appreciated. The recent unfortunate incident in one of our large universities, although not proven to have been due to the pharmacist, brought out this lack of appreciation of the importance of the responsibility assumed by every practitioner of pharmacy. Our President sent for me at once and wished to know what precautions I was taking to prevent error in the compounding of our 5000 or more prescriptions a year. We have been compounding student prescriptions for years and yet the importance of the work had not heretofore been brought forcibly to his attention. Several members of our Faculty said to me, "Do you not worry about the responsibilities you voluntarily assumed?" I said, "I have always appreciated them." The answer invariably was, "Your students must be carefully and thoroughly trained for their work."

No profession has advanced as rapidly as has pharmacy during the past few years and, therefore, I am proud to speak for it to-night. It has not reached our ideal but the outlook is very hopeful because of its recent long forward strides.

Until a comparatively few years ago, many of our States had no control over the practice of pharmacy. Any who wished could open a drug store, sell poisons, and compound prescriptions. There were a number of good colleges of pharmacy but the product of these colleges was only a "drop in the bucket" and, therefore, we had a great number of drug stores; a very high percentage of the total were manned by men who had no college training and who were out of sympathy with it. Naturally, it was very difficult to convince this majority of the need of collegiate training. The problem was further complicated by the fact that a considerable percentage of the trade of the average drug store in many aspects is commercial. In order to advance it was necessary to push forward the dead weight represented by these commercial drug stores, the operators of which were more or less convinced of the futility of college training for successful service and business advancement.

It was a Herculean task because it had to be preceded by an extensive campaign of education. Fortunately there were a number of men of vision, such as your own Dean Rudd, in charge of our colleges of pharmacy. These men acting through a constituted agency, The American Association of Colleges of Pharmacy, were the yeast that eventually leavened the whole mass of indifference and brought forth the bread of professional advancement.

The National Association of Boards of Pharmacy also has been an important agency in aiding this professional advancement of pharmacy. Among a number of men of this Association who stand out as beacon lights to aid in guiding the ship of Pharmacy, none are more forward-looking than A. L. I. Winne of Virginia.

Ten years ago not more than three States required a college training for entrance to pharmacy. Five years ago there were but a few colleges of pharmacy and only one or two States that required full high-school training for entrance and for admittance to licensing examinations. To-day a great number of the States require college training for permission to take the licensing examination and this number is increasing every year. All the reputable colleges of pharmacy demand high-school graduation or its equivalent for entrance and since September of last year these colleges have eliminated their two-year courses and are requiring a three-year course as a minimum. As I have indicated, this advancement has all taken place within the space of a few recent years. This gives us reason to believe that the professional machine of Pharmacy so well started will not stop until a baccalaureate degree will be the lowest degree recognized by Pharmacy. It was a long, hard fight to secure the entering wedge for professional advancement, but the beneficial effects of higher standards became apparent at once and the rest of the battle was comparatively easy.

Pharmacy is indeed fortunate in that it is the only profession that has been surveyed from a functional standpoint. This survey, conducted for the Commonwealth Fund by Dr. Charters and assisted by a number of teachers of Pharmacy, has been completed. The report of it is not yet in print but we know enough about what that report will be to be assured that the American Association of Colleges of Pharmacy acted wisely when it eliminated the two-year course and adopted the three-year course as a minimum. We anticipate that this report will show us the need of a longer training for good professional work. At any rate, it will tell us

very definitely whether or not we are teaching the things that must be known by the every-day pharmacist in the conduct of his professional business.

It gives me pleasure to say that the Pharmacy Colleges of the South, especially those of the Medical College of Virginia, the University of North Carolina, the Medical College of the State of South Carolina and the University of Mississippi, have taken a very active part in this movement and to these colleges of pharmacy belongs a great deal of credit for the achievements I have related. It is true there are still some backward States and weak colleges but the tendency is decidedly upward and we have every reason to believe that the time is not far distant when these States and colleges will be in accord with us.

In the laboratories of our colleges of pharmacy and of our pharmaceutical manufacturers an enormous amount of research has been done and a great deal has been added to the sum total of human knowledge. Yet the surface of this important work has only been scratched and an almost unlimited amount of research is yet to be done. We cannot expect much of it to be done by the busy retail pharmacist, as his mind is directed to other things. We do hope that our colleges of pharmacy will do their part of this most important work. This cannot be accomplished unless our institutions offer the opportunities and encourage the research worker. We have not yet discovered a "Rockefeller" of Pharmacy but we hope that modest contributions to this work will be given by a number of persons and thus be better able to assist our physicians in their fight against disease.

Graduate work in Pharmacy is necessary to improve old preparations and remedies and to develop new ones. A great deal of research work must be done before satisfactory tests and analyses of some of our U. S. Pharmacopœial products are developed. This work could very well be part of our graduate courses. Many of our colleges are doing graduate work but the amount done in research is small in comparison with the needs.

Several colleges select assistants who have baccalaureate degrees and ask them to give half of their time to the college and half to preparation for a graduate degree. We, at Purdue, are pursuing that policy with a great deal of satisfaction to both the applicants and the college. These graduate students are assigned some research problems involving scientific Pharmacy. Our State-supported institutions should encourage research in Pharmacy by offering opportunity to any who show aptitude for it, be it a member of the faculty or a student, and by appropriation to the budget of the college sufficient to supply the needs of research workers. This latter is but a small part of the problem; the greater part of it is in securing individuals who are mentally fitted for research and the stimulation and encouragement of this aptitude.

To the professions of Medicine, Dentistry, Nursing and Pharmacy is given the great responsibility of keeping the people well, curing those who are ill and giving relief to those who suffer. This obligation can best be discharged by these four professions working in complete unity and harmony.

The Medical College of Virginia is unique in that it trains for these four and only these four professions. This then is the ideal institution to foster this close coöperation and interdependence. From what I know of the College, I can say that this is being done to the satisfaction of all four professions, and for the benefit of public health.

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and Branches shall become the property of the Association with the understanding that they are not to be published in any other publication prior to their publication in those of the Association, except with the consent of the Council." —Part of Chapter VI, Article VI of the By-Laws.

Article IV of Chapter VII reads: "Each local branch having not less than 50 dues-paid members of the Association, holding not less than six meetings annually with an attendance of not less than 9 members at each meeting, and the proceedings of which shall have been submitted to the JOURNAL for publication, may elect one representative to the House of Delegates."

Reports of the meetings of the Local Branches shall be mailed to the Editor on the day following the meeting, if possible. Minutes should be typewritten, with wide spaces between the lines. Care should be taken to give proper names correctly, and manuscript should be signed by the reporter.

UNIVERSITY OF WASHINGTON.

The April meeting of the University of Washington Branch, A. PH. A., was held at Bagley Hall, May 27th. Fifty members were present.

Harry W. Ayers, Secretary of the Washington State Pharmaceutical Association, was the principal speaker of the evening, using as his topic, "The Laws Relating to Pharmacy in This State." Beginning with a survey and classification of laws he entered into a detailed discussion of specific laws. One of the confusing factors for the State druggists is the relation between the State Narcotic Law and the Harrison Act. So far the State act has been utilized mainly in turning cases over to the State courts. Yet a rigid enforcement of the State Act would cause many difficulties on part of the pharmacist due to apparent conflicts. These points were explained by Mr. Ayer. A general discussion followed Mr. Ayer's talk.

MAY MEETING.

The May meeting, University of Washington Branch, A. PH. A., was held Thursday, the 27th, at the University Commons, preceded by a dinner in which 90 participated. The dinner was enlivened by nominating speeches given by the supporters of candidates for officers in the Branch. Soap boxes were provided and the promoters in some cases brought forth qualities heretofore unheard of in either candidate or promoter. The formal election resulted in the following:

President, E. W. Rising
Vice President, P. S. Jorgenson
Secretary, H. A. Langenhan
Treasurer, Miss Caty Bradford.

Dr. C. W. Johnson was duly elected delegate to the national convention at Philadelphia.

At this time the Agrarian Society asked permission to function for a few minutes. This society, a local one of unknown origin or function, presented their "annual honorary" in form of a brier pipe, apparently their principal implement of work, and a bandanna handkerchief, the badge of the society, to Dr. Langenhan.

An enjoyable contribution to the evening's entertainment were the vocal selections by Miss Evelyn Moseley accompanied by Miss Margaret Hammond.

Harry W. Ayer, Secretary of the Washington State Pharmaceutical Association, gave a brief report on convention plans. He also announced a dinner given in honor of S. C. Henry, to which all were invited.

Dean Johnson was then called upon who, after some preliminary remarks, announced the honor students of the graduating class. They were as follows:

Frank A. Lee, *Denny Fellowship*
Marion Brimston, *Lehn and Fink Medal*
Clementine Evans, *A. Ph. A. Branch Medal*
Louis Fischer, *Linton Memorial Honor*

The three "memberships" granted in Pharmacy, Chemistry and Materia Medica, by the National Association of Retail Drug Clerks, were given to Abigail Poole, John F. Bradshaw and Ray Burston.

The following appointments to teaching fellows in the college were announced: Miss Caty Bradford, Arnold Lehman, Leon Richards and E. W Rising.

President Bradshaw then surrendered the chair to the newly elected President, E. W. Rising.

H. A. LANGENHAN, *Secretary.*

ASSOCIATION BUSINESS

AD INTERIM BUSINESS OF THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1925–1926.

Office of the Secretary, 10 West Chase St., Baltimore, Md.

LETTER NO. 13.

June 12, 1926.

To the Members of the Council:

95. Motion No. 45 (See Council Letter No. 12, page 504) has been carried.

96. Motion No. 46 (See Council Letter No. 12, page 505) has been carried and the parties mentioned in this motion have been notified.

97. Motion No. 47 (See Council Letter No. 12, page 505) and *Motion No. 48* (See Council Letter No. 12, page 505) have been carried. Applicants for membership numbered 128 to 141, inclusive, and applicants for membership numbered H-251 to H-255, inclusive, are therefore declared elected.

98. With the approval of Local Secretary Hunsberger and his associates, Secretary Kelly submits the following tentative program for the Seventy-fourth Annual Meeting to be held at Philadelphia, Pa., the week of September 13, 1926. Secretary H. C. Christensen and Secretary Zada M. Cooper have approved that part of the tentative program affecting the National Association of Boards of Pharmacy and the American Association of Colleges of Pharmacy, respectively.

TENTATIVE PROGRAM FOR THE SEVENTY-FOURTH ANNUAL MEETING, A. PH. A.

MONDAY, SEPTEMBER 13, 1926.

9:00 A.M. Meeting of the Council, A. PH. A.
9:00 A.M. National Association of Boards of Pharmacy.
9:00 A.M. American Association of Colleges of Pharmacy.
Teachers' Conferences:
Chemistry Section.
Practical Pharmacy Section.
Materia Medica, Pharmacognosy and Botany Section.
2:00 P.M. National Association of Boards of Pharmacy.
2:00 P.M. American Association of Colleges of Pharmacy.
8:00 P.M. National Association of Boards of Pharmacy.
8:00 P.M. American Association of Colleges of Pharmacy.

TUESDAY, SEPTEMBER 14, 1926.

9:00 A.M. Joint Session, National Association of Boards of Pharmacy and American Association of Colleges of Pharmacy.
2:00 P.M. National Association of Boards of Pharmacy.
2:00 P.M. American Association of Colleges of Pharmacy.
3:00 P.M. Afternoon Tea. For ladies only.
7:00 P.M. First Session, House of Delegates, A. PH. A.
8:00 P.M. First General Session, A. PH. A. Dancing and Refreshments following the First General Session.

WEDNESDAY, SEPTEMBER 15, 1926.

9:00 A.M. First Session, Section on Historical Pharmacy.
9:00 A.M. First Session, Section on Commercial Interests.
9:00 A.M. First Session, Scientific Section.
10:00 A.M. Trip to Wanamakers, inspection, shopping, luncheon, music, returning about 3 P.M. For ladies only.
2:00 P.M. Second Session, House of Delegates, A. PH. A.
7:00 P.M. Meeting of the Council, A. PH. A.
9:00 P.M. President's Reception and Ball.

THURSDAY, SEPTEMBER 16, 1926.

8:00 A.M. Meeting of the Council, A. PH. A.
9:00 A.M. First Session, Section on Practical Pharmacy and Dispensing.
9:00 A.M. First Session, Section on Education and Legislation.
9:00 A.M. Second Session, Scientific Section.
9:00 A.M. First Session, Women's Section.
10:00 A.M. Stroll through Rittenhouse Square and club section, followed by luncheon. For ladies only.
1:00 P.M. Second General Session, A. PH. A.

3:00 P.M. Trip to Glenolden. Inspection of the plant followed by dinner. Train leaves Broad Street Station at 3:15 P.M. and leaves Glenolden for the return trip at 8:12 P.M.

9:00 P.M. Third Session, House of Delegates, A. PH. A.

FRIDAY, SEPTEMBER 17, 1926.

9:00 A.M. Second Session, Section on Historical Pharmacy.

9:00 A.M. Second Session, Section on Commercial Interests.

9:00 A.M. Third Session, Scientific Section.

10:00 A.M. Trip through historical section of Philadelphia. For ladies only.

11:00 A.M. Joint Session, Scientific Section and Section on Practical Pharmacy and Dispensing.

1:30 P.M. Second Session, Section on Education and Legislation.

1:30 P.M. Second Session, Section on Practical Pharmacy and Dispensing.

3:00 P.M. Final Session, House of Delegates, A. PH. A.

6:00 P.M. Dinner and Entertainment.

8:00 P.M. Final General Session, A. PH. A.

10:00 P.M. Meeting of the Council, A. PH. A.

SATURDAY, SEPTEMBER 18, 1926.

9:00 A.M. All-day trip to the Sesqui-Centennial International Exposition. Tickets furnished to those registered.

(*Motion 49.*) *It is moved by LaWall that the tentative program submitted by Secretary Kelly be approved by the Council.*

99. The following letter has been received from Chairman DuMez of the Publications Committee:

"I am enclosing herewith my reply to Prof. Stroup's request to use portions of the text of the NATIONAL FORMULARY V in a new edition of 'Pharmaceutical and Medical Chemistry' by Sadtler and Coblentz.

"Use was made of the NATIONAL FORMULARY in the previous edition of this chemistry and I can see no reason why permission should not be granted again. I am, therefore, recommending to the Council that permission be given Profs. Stroup and Hostmann for partial use of the text of the NATIONAL FORMULARY V in 'Sadtler and Coblentz Pharmaceutical and Medical Chemistry.' "

(*Motion 50.*) *It is moved by DuMez that Profs. Freeman P. Stroup and Jeannot Hostmann be granted permission to use the text of the N. F. V for partial reproduction in Sadtler and Coblentz Pharmaceutical and Medical Chemistry, and at the usual charge of $5.00.*

100. Applicants for Membership: The following applicants properly endorsed and accompanied by the first year's dues have been received:

No. 142, Hervey Winfield Ackerman, 1923 Lehigh St., Easton, Pa.; No. 143, Blake H. Battin, 6700 Ogontz Ave., Philadelphia, Pa.; No. 144, Howard L. Bobb, 2015 E. Elkhart St., Philadelphia, Pa.; No. 145, David Aaron Bookstein, 257 S. 57th St., Philadelphia, Pa.; No. 146, James Daniel Bower, 1417 Walnut St., Jersey Shore, Pa.; No. 147, James Davis Bower, Wellsboro, Pa.; No. 148, Leighton McCauley Cope, 1961 Germantown Ave., Philadelphia, Pa.; No. 149, V. George Degutis, 1522 Wood St., Philadelphia, Pa.; No. 150, Hyman Friedman, 711 Bridge St., Trenton, N. J.; No. 151, Irene L. Fugere, 337 St. Paul St., Brookline, Mass.; No. 152, Vivian J. Gelpi, 508 Chartres St., New Orleans, La.; No. 153, Arthur Leonard Johnson, Carrington, N. D.; No. 154, Ruth E. Johnson, 11 Bellevue St., Waltham, Mass.; No. 155, Michael Kaczmaczyh, 1125 East Pine St., Mahanoy City, Pa.; No. 156, George Kanes, 4219 Stiles St., Philadelphia, Pa.; No. 157, Charles McCausland, 6139 Christian St., Philadelphia, Pa.; No. 158, Joseph Francis McDonnell, Jr., 407 York Road, Jenkintown, Pa.; No. 159, Ralph Geist Miller, 1516 Walnut St., Jersey Shore, Pa.; No. 160, Samuel Buzby Moffitt, 943 S. Paxon St., Philadelphia, Pa.; No. 161, Joseph Eugene O'Laughlin, 250 Duerr St., New Martinsville, W. Va.; No. 162, Charles Pace, 1801 S. 21st St., Philadelphia, Pa.; No. 163, Joseph Purpuri, 1747 N. 19th St., Philadelphia, Pa.; No. 164, Robert A. Repetto, 203 Holland St., Somerville, Mass.; No. 165, Frank Louis Roma, 4638 Greene St., Germantown, Philadelphia, Pa.; No. 166, Joseph H. Seligman, 28 Ingleside St., Roxbury, Mass.; No. 167, Harry David Silver, 3854 N. Percy St., Philadelphia, Pa.; No. 168, Halfdan Samuel Tvedt, 220 N. State St., Chicago, Ill.; No. 169, Maurice Willoughby Waite, 54 E. Slocum St., Philadelphia, Pa.; No. 170, Jacob Weissbuch, 249 Jefferson Ave., Brooklyn, N. Y.; No. 171, Ellis Cairns White, Ambler, Pa.; No. 172, Anthony Emile Wickham, 3rd & Central Ave., Sea Side Park,

N. J.; No. 173, Elwood Smith Wilkins, Jr., 42 Hillside Road, Ashley, Del.

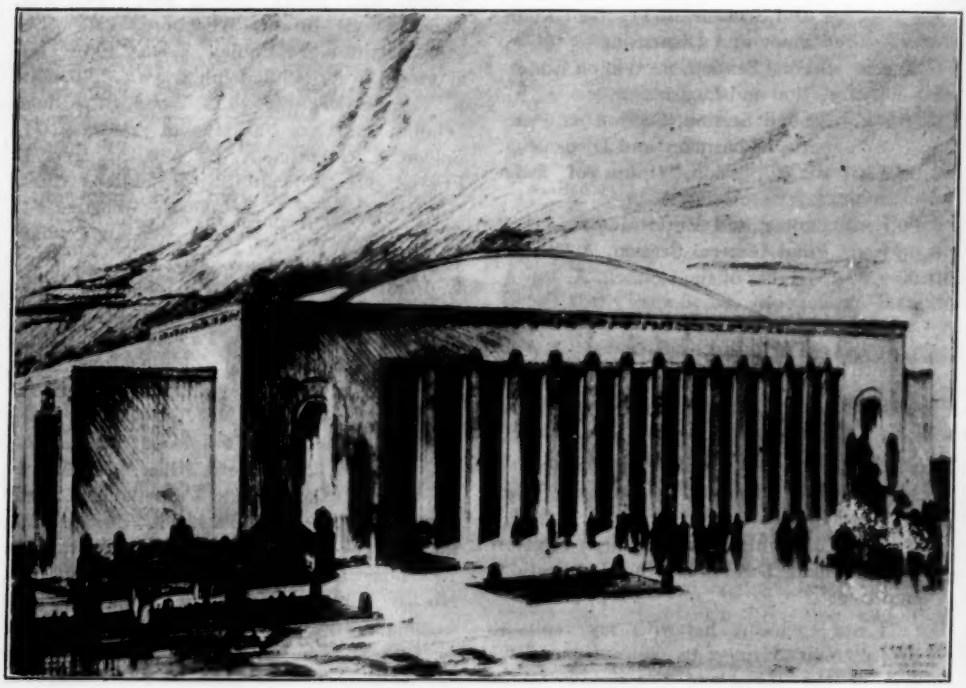
(*Motion 51.*) *Vote on applications for active membership in the American Pharmaceutical Association.*

101. Applicants for Membership on Account of Contributions to the Headquarters Building Fund. The following non-members of the A. PH. A. have pledged $25.00 or more to the Headquarters Building Fund and have made a cash payment of $5.00 or more. They are entitled to membership and you are requested to vote on the applications which have been properly endorsed.

H-256, Franklin J. Bacon, University of Florida, College of Pharmacy, Gainesville, Fla.; H-257, Alfred C. Biscof, 200—2nd St., N. W., Mandan, N. Dak.; H-258, Lyman David Fonda, 238 Florida St., Gainesville, Fla.; H-259, Francois Archibald Gilfillan, Science Hall, Univ. of Florida, Gainesville, Fla.

(*Motion 52.*) *Vote on applications of contributions to the Headquarters Building Fund for Membership in the American Pharmaceutical Association.*

E. F. KELLY, *Secretary.*



AUDITORIUM—SESQUI-CENTENNIAL, PHILADELPHIA.—Courtesy *N. A. R. D. Journal.*

The Auditorium, 448 ft. long, 274 ft. wide and seating 20,000 persons, is of steel frame construction covered with stucco, as are the main exhibition buildings. It will be equipped with loud speakers and the latest appliances for broadcasting by radio. The organ being specially built for the Auditorium is valued at $100,000. Daily recitals by prominent organists will be a feature. All large indoor meetings as well as concerts and other entertainments will take place in the Auditorium.

EDITORIAL NOTES

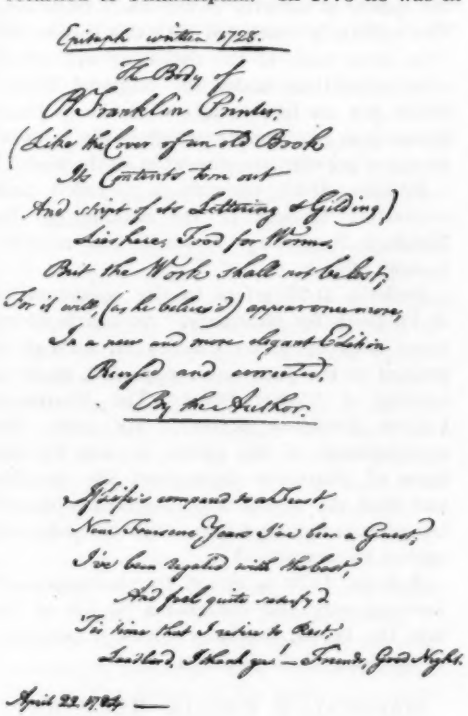
Editor: E. G. EBERLE, 10 West Chase St., Baltimore, Md.

Members of the Council, A. PH. A.: S. L. HILTON, *Chairman;* W. C. ANDERSON, *Vice-Chairman;* E. F. KELLY, *Secretary;* JAMES H. BEAL, CHARLES H. LAWALL, HENRY M. WHELPLEY,* H. V. ARNY, A. G. DUMEZ, H. C. CHRISTENSEN, JULIUS A. KOCH, ROBERT P. FISCHELIS. *Ex-Officio:* L. L. WALTON, President; Vice-Presidents, W. C. ANDERSON, CLYDE L. EDDY; E. F. KELLY, Secretary; C. W. HOLTON, Treasurer; WILLIAM D. JONES, Chairman of the House of Delegates. Editors of the JOURNAL and YEAR BOOK: E. G. EBERLE and A. G. DUMEZ. Committee on Publications: A. G. DUMEZ, *Chairman;* R. P. FISCHELIS, H. V. ARNY, H. M. WHELPLEY,* E. F. KELLY, C. W. HOLTON, E. G. EBERLE.

Collaborators: The Members of the Council; the Editor of the YEAR BOOK, A. G. DUMEZ; E. FULLERTON COOK, Chairman, U. S. P. Revision Committee; W. L. SCOVILLE, Chairman, N. F. Revision Committee; the Chairmen of the Sections, A. PH. A.: F. F. BERG, J. G. BEARD, H. C. NEWTON, AMBROSE HUNSBERGER, L. K. DARBAKER; WILLIAM D. JONES, Chairman of the House of Delegates, A. PH. A.; EDWARD H. KRAUS, President, A. A. C. P.; CHARLES B. JORDAN, Chairman Executive Committee, A. A. C. P.; M. N. FORD, President, N. A. B. P.; HENRY C. CHRISTENSEN, Secretary, N. A. B. P.

CENTENARIES.

It was in 1726 that Benjamin Franklin after more than a year's sojourn in England returned to Philadelphia. In 1776 he was in


Epitaph written 1725.

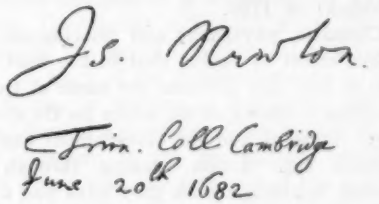
The Body of
B. Franklin Printer,
(Like the Cover of an old Book
Its Contents torn out
And stript of its Lettering & Gilding)
Lies here, Food for Worms.
But the Work shall not be lost,
For it will (as he believed) appear once more,
In a new and more elegant Edition
Revised and corrected.
By the Author.

A Slave's compared to a Book
Now Fourscore Years I've been a Guest,
I've been regaled with the best,
And feel quite satisfy'd
'Tis time that I make the Rest.
Landlord, I thank you! — Friends, Good Night.

April 22. 1784 —

Paris seeking financial aid for the United States. John Adams who came to Paris during the following year wrote of Franklin's popularity in France: "Franklin's reputation is more universal than that of Leibnitz or Newton, Frederick or Voltaire; and his character more beloved and esteemed than any or all of them." It is fitting that organizations of the Press, in its various activities, make pilgrimages to the grave of "B. Franklin, Printer," an annual custom of Poor Richard Club, of Philadelphia. The Advertising Clubs of the world followed not only the example of the former during their recent convention, but responded to the dictates of their pride in belonging to the craft which Benjamin Franklin honored.

Leibnitz is celebrated for the universality of his genius and known as the inventor of the differential and integral calculus, the principle of which was independently discovered by Newton. March 20th of next year will be the bi-centenary of Newton's death. The latter name is recalled because of the meeting of the American Chemical Society. Newton lived during earlier school years with an


Js. Newton.

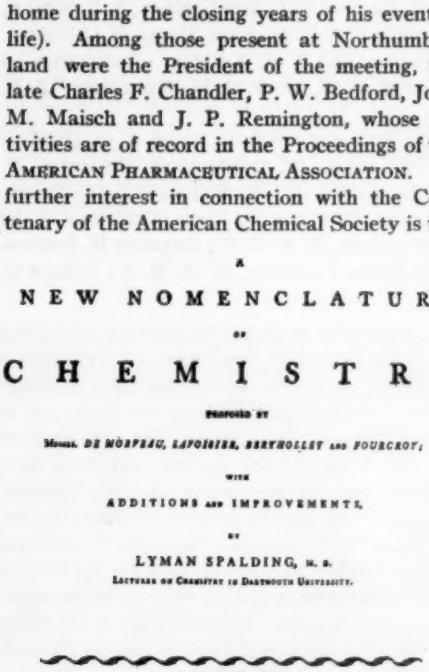
Trin. Coll Cambridge
June 20th 1682

apothecary named Clark, in whose shop the embryo scientist served as assistant during leisure hours.

The year 1774 is usually given as the birth-year of chemistry, because of the many im-

* Deceased June 26, 1926.

portant discoveries about this time, and a shining light among these discoverers was Karl Wilhelm Scheele, who established his apothecary shop in Köping, Sweden, about 150 years ago. In 1874 the Centennial of Chemistry was celebrated at Northumberland (Priestley's home during the closing years of his eventful life). Among those present at Northumberland were the President of the meeting, the late Charles F. Chandler, P. W. Bedford, John M. Maisch and J. P. Remington, whose activities are of record in the Proceedings of the AMERICAN PHARMACEUTICAL ASSOCIATION. Of further interest in connection with the Centenary of the American Chemical Society is the


A

NEW NOMENCLATURE

OF

CHEMISTRY,

PROPOSED BY

MESSRS. DE MORVEAU, LAVOISIER, BERTHOLLET AND FOURCROY;

WITH

ADDITIONS AND IMPROVEMENTS,

BY

LYMAN SPALDING, M. D.

LECTURER ON CHEMISTRY IN DARTMOUTH UNIVERSITY.

HANOVER, (N. H.)

PRINTED BY MOSES DAVIS.

M,DCC,XCVI.

fact that Dr. Lyman Spalding, father of the U. S. Pharmacopœia, gave to the chemists a translation of "A New Nomenclature of Chemistry," proposed by Messrs. De Morveau, Lavoisier, Berthollet and Fourcroy, with additions and improvements made by the Lecturer on Chemistry in Dartmouth University (Lyman Spalding) in 1796.

Chemists, physicians and pharmacists will reflect credit by seeing that in the next election to the Hall of Fame the name of Lyman Spalding is chosen as the leader for the distinction. Citizens and the Government can well endorse such action because through Dr. Lyman Spalding's work they have had a protection given them by the Food and Drug Laws for which the U. S. Pharmacopœia provides the standard. Herein is an opportunity for coöperation wherein chemists and pharmacists may whole-heartedly join with the medical profession, of which Dr. Lyman Spalding was an honored member.

References to these centenary events remind us of the rapidly approaching meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION, during the week of September 13—less than 2 months hence. Make your preparations to attend.

BULLETINS OF THE DRUG TRADE BUREAU OF PUBLIC INFORMATION.

Director Robert P. Fischelis has issued Bulletins D-27 to D-30, inclusive, of the Drug Trade Bureau of Public Information.

Bulletin D-27 relates to a discussion by Samuel C. Henry of the bills pending in Congress providing for stricter regulation of narcotics and alcohol. He states that under Regulation 35 of the Harrison law the innocent pharmacist who fills the prescripton of a dishonest physician is made as guilty as the physician. He considers Senate Bill 4085 would hamper and annoy registered pharmacists and would not interfere with the sphere of activity of the illicit trafficker. The bulletin is concluded with this statement: "The drug trade of the nation as well as all other permittees under the National Prohibition Act are face to face with the problem of one-man government, which is the greatest enemy of popular government in all the world."

Bulletin D-28 presents a detailed and interesting account of the making of the National Formulary V which has recently become official.

Bulletin D-29 refers to the opportunities of publicity for pharmacy. An article along these lines by Dean Charles H. LaWall is printed in the June issue, page 492, under a caption of "What Should The Pharmacy College Professor Know?" He urges the establishment of free public lectures by colleges of pharmacy throughout the country and that the members of the faculty should be prepared to provide scientific advisory service to newspapers.

Bulletin D-30 is issued to pharmaceutical journals only and contains a sketch of the late Dr. H. M. Whelpley which is published in this issue of the JOURNAL.

MARSHALL'S KAOLIN EXCIPIENT.

Dr. Bernard Fantus has been contributing a series of articles to the *Journal of the American Medical Association* entitled, "The Technique of Medication." In one of these he refers to Marshall's excipient for pills containing chemicals that are de-

stroyed by organic substances such as silver nitrate and potassium permanganate. In this two parts of kaolin are used in connection with one part of anhydrous sodium sulphate. The technique is described:

"The powdered drug is mixed with the requisite amount of kaolin; half as much anhydrous sodium sulphate as kaolin is added and, after mixing, the whole is massed with about the same weight of water as of sodium sulphate. The mass must be kept above 33° C. until the pills are finished. When the temperature of the pills falls to that of the room, they become of stony hardness. The method depends on the fact that 33° C. is a critical temperature for sodium sulphate. Above that temperature the sodium sulphate exists in the anhydrous form; hence the water is free, and the mixture is a plastic mass. Below 33° C. the sodium sulphate exists as Na_2SO_4, 7 H_2O. Hence, when the temperature falls, this hydrated salt crystallizes out and the pills rapidly become hard. The pills disintegrate quickly, owing to the ready solubility of this salt in water."

SO-CALLED EPHEDRINE HYDROCHLORIDE.

A signed statement in the *Journal of the American Medical Association*, for July 3, by Dr. T. Grier Miller, K. K. Chen, and Karl F. Schmidt, recites as follows:

"We have recently had some experience with a preparation of so-called ephedrine hydrochloride which was sold by a druggist in Philadelphia. He obtained it from an English drug house, the source and method of preparation being unknown. This sample of drug was not effective clinically in the control of asthma in a patient who had been completely relieved by the Peking product (Miller). Experimentally it was capable of relaxing the bronchial spasm produced in pithed cats by physostigmine (Schmidt). Its melting point and optical rotation are not those of pure ephedrine hydrochloride or of psuedo-ephedrine hydrochloride, its optical isomer, and it does not give the color reactions of ephedrine and psuedo-ephedrine (Chen). The nature of the material is therefore uncertain."

This is reported as a warning against the indiscriminate use of any preparation that does not meet the standards of the identifications that were described by Dr. Chen.

In the March number, JOURNAL A. PH. A., for 1925, p. 189, an article will be found by Dr. K. K. Chen entitled "A Pharmacognostic and Chemical Study of Ma Huang (*Ephedra vulgaris* var. *Helvetica*)." See also JOURNAL A. PH. A. for June, 1926, p. 509.

CRYSTALLINE INSULIN.

Dr. John J. Abel and his co-workers at the School of Medicine of Johns Hopkins University have reduced insulin to a crystalline purity. While this is wonderful progress, Dr. Abel states that a year or more of work will intervene before its analysis is completed.

THE AEDOS MOSQUITO CARRIER OF DENGUE FEVER.

Surgeon General Ireland has made public a statement relative to *Aedos egypti*, as carrier of dengue fever. This mosquito, according to the statement, is the only carrier of the germ. To become infected, the mosquito must bite the patient with dengue during the first three days of illness, the living organism causing the disease must live and mature in the mosquito for 11 days before the insect becomes capable of transmitting the disease through its bites, and once the mosquito becomes capable of transmitting the disease, it retains that capacity throughout the remainder of its life.

The research work on dengue was completed just one year ago, and as a result of the application of the knowledge obtained, reports recently have reached the office of the Surgeon General to the effect that whereas in 1924, 80 soldiers in every 1000 on duty in the Philippines suffered attacks of dengue, in 1926 the number had been reduced to slightly less than 20 in every thousand.

CALCIUM CYANIDE HELD GOOD PLANT FUMIGANT.

A new Department Circular, No. 380-C, "Calcium Cyanide as a Fumigant for Ornamental Greenhouse Plants," gives details concerning the use of this chemical as a fumigant. A copy of the publication may be obtained free, by writing to the United States Department of Agriculture, Washington, D. C.

On exposure to the air calcium cyanide slowly reacts with the moisture of the atmosphere and gives off hydrocyanic acid gas. Customers should be warned of its danger.

PERSONAL AND NEWS ITEMS.

Chairman F. F. Berg, of the Scientific Section, A. PH. A., is expected to return from his trip to Europe the latter part of this month.

Joseph Jacobs gives an interesting historical account of the growth of Atlanta in the *Atlanta Georgian* of recent date. Mr. Jacobs can speak from experience as he came to Atlanta in 1884.

Milton Campbell, Leonard A. Seltzer, P. Henry Utech, Josiah K. Lilly, and **Otto W. Osterlund** have been given the honorary degree of Master in Pharmacy by the Philadelphia College of Pharmacy and Science.

In a letter from **Chairman E. Fullerton Cook,** of the U. S. P. Revision Committee, who is studying at the University of Bern, he expresses himself as well pleased with the condition of things. However, he has little idle time and that is really given over to perfecting his knowledge of German. He remarks on the pride students at the University have, because of their University privileges and opportunities. He dwells on the beauty of the lower passes of the Alps; "It is impossible," he says, "to lose the impression in viewing the scenery that it is not a painting."

Dr. E. M. Chamot, Cornell University, delivered a lecture in the John Harrison Laboratory of Chemistry, University of Pennsylvania, on the subject of "Chemical Microscopy: Its Aims and Its Possibilities." He pointed out that some analyses that are impossible with other methods are easily determined, in experienced hands, with the aid of the microscope.

Dean Willis G. Gregory in an article on "Where Is the Market?" discusses the college curriculum extending over the three- and four-year periods. Among other questions he asks the following:

"Where will three- and four-year graduates find employment?

"What salaries will three and four years of study and expense justify?

"Will college classes remain large if the graduates are dissatisfied with conditions of employment?

"Will pharmacy colleges not supported by state treasuries be happy with decreased classes?

"If the supply of pharmacists is decreased, will the public be as well served by untrained clerks?

"Will higher-priced pharmacists increase the number of drugless drug stores?

"Is there enough professional work in the average drug store to-day to justify three and four years' training?

"Can these questions be answered in advance, or must we wait for experience?"

Prof. H. G. Greenish, in his very interesting description of the methods used in the production of flowers of sulphur at the Rotherhithe factory which he visited, refers to the practice prevalent among compilers of textbooks of perpetuating in their books accounts of processes and illustrations of apparatus which have long become obsolete. No doubt the professor could if he would quote a good many instances of this misleading habit, and their prejudicial effect on the student who depends on theoretical rather than practical information on a given subject. A similar charge might be levied in connection with many of the formulas and "scientific" abstracts which are published in the pharmaceutical press and in works of reference. A suggested formula may be published in a medical or pharmaceutical paper; it is copied into other papers at home or abroad; often in transcribing an error creeps in which is perpetuated when the formula is embodied—as often happens—in a work of reference. When the practicing pharmacist "tries out" the "recipe" he finds it useless or unworkable, and pours scorn on the originator. Even our most respected standard works of reference are not free from blame in the matter, although it would be invidious to quote examples.—*The Pharmaceutical Journal.*

Dr. J. J. Hofman, the Secretary of the International Pharmaceutical Federation, in a letter to the British Pharmaceutical Society, mentions that he is a collector of book-plates, and that he would be glad to receive copies of book-plates of pharmaceutical interest. If any reader having such a plate is willing to present a copy to Dr. Hofman, it can be sent him at Schenkweg 4–6, La Haye, Holland.

Dr. Neil E. Gordon, head of the department of chemistry of the University of Maryland, and state chemist of Maryland, sailed on May 31 from New York for a European tour in the interest of chemical education.

Prof. Otto Raubenheimer and family sailed for Europe. They hope to return early in the Fall. The tour will take them through Germany, Switzerland and Holland.

Dean E. V. Howell, University of North Carolina School of Pharmacy, entertained the pharmacy students on May 22, with a barbecue. It is an annual event which has added to the fame of the Dean as host. The day was enjoyed at Grannyborough Hole on New

Hope Creek; fishing, swimming, field sports and athletics were part of the day's program.

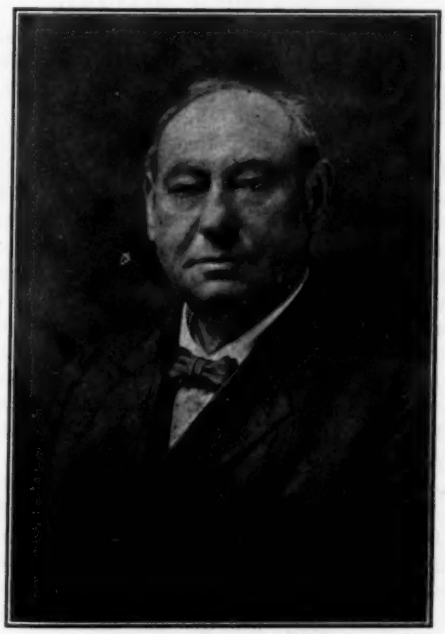
The students of the School of Pharmacy have subscribed more than $2000 to the A. PH. A. Headquarters' Fund.

Ex-President H. H. Rusby opened the series of Botanic Garden Lectures at Bronx Park, July 10. His subject was "Immunization against Diseases Caused by Microscopic Plants."

The New York Public Library has compiled a list of references covering the publications in the library on the chemistry and manufacture of writings and printings. A list of patents in connection therewith also has been prepared.

The U. S. Bureau of Chemistry is testing out the resistance to light of various inks.

Wilhelm Bodemann celebrated his 80th birthday on June 6 and reports are that he is in excellent physical condition. He was the recipient of so many congratulatory letters that it was necessary for him to issue a general note of appreciation to those who thought of him on his anniversary. "Jamieson Day" was celebrated by the C. V. D. A. at the Germania Club on which occasion Fra. Wilhelm sketched the members of the Round Table; it has been referred to as a "Scenario."



HARVEY W. WILEY.

Dr. Harvey W. Wiley was given a luncheon last month at the New York Lawyers' Club. A birthday cake representing Dr. Wiley's eighty years featured the occasion. Testimonials and expressions of appreciation came from many and a number of speeches setting forth his work were made by guests at the table.

The home of John Bartram at 54th St. below Woodland Ave., Philadelphia, is again open to the public, after considerable work of restoration which was done by the Fairmount Park Commission and the John Bartram Association. As is well known, John Bartram was the pioneer botanist of this country.

Prof. H. H. Bartlett, of the University of Michigan, has been named collaborator by the Smithsonian Institute to make studies of plants in Formosa and Sumatra.

The "Coöperator" of recent date had an illustrated article on the store of Julius H. Riemenschneider, Chicago. It may be pointed to as one of the instances of returning to pharmacy from a modern drug store, and with notable success.

Howard Kirk, lecturer on Pharmaceutical Jurisprudence and Commercial Law at the Philadelphia College of Pharmacy and Science, addressed the Philadelphia Drug Exchange at its annual outing on June 4. His subject was "Lawful Price Maintenance."

J. H. Gow, chairman of the general committee of the Maine Pharmaceutical Association, has appointed his committee to prepare for the annual meeting of the Association at Belgrade Lakes on September 15. The committee had a meeting in Lewiston on June 9. It consists of A. H. Perkins, C. C. Files, C. C. Libby, L. C. Bailey and G. O. Tuttle, of Portland; Francis Frawley, of Bangor; Ralph Lochhead, of Auburn; F. Carroll Coughlin, H. E. Goodrich and J. F. Young, of Augusta; H. M. Tibbetts of Hallowell and J. H. DeOrsay, of Waterville.

Dr. C. A. Mills of Cincinnati, who has been given a two years' leave of absence from his duties as Professor of Internal Medicine at the Medical College of the University of Cincinnati, sailed for Pekin June 12, where he will teach medicine and do experimental and research work at Pekin University. A dinner was tendered to him by **Charles G. Merrell** before his departure.

Harry G. Schmuelling, former President of the Ohio State Pharmaceutical Association, will again contest for membership in the state legislature and he is strongly supported by the druggists of his district.

The D. A. Schulte interests have contracted for the purchase of control of the American Druggists' Syndicate, according to newspaper account.

Reserve Medical Officers are doing active duty at Carlisle Barracks and Aberdeen Proving Grounds.

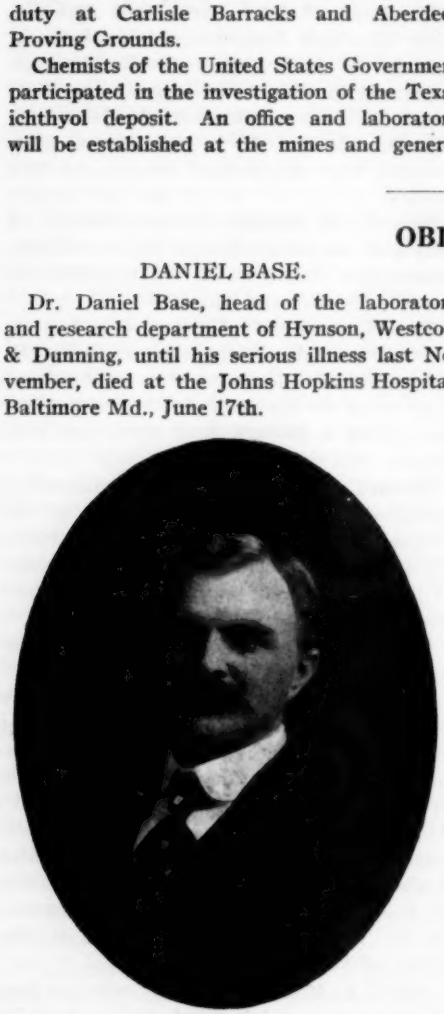
Chemists of the United States Government participated in the investigation of the Texas ichthyol deposit. An office and laboratory will be established at the mines and general offices and a laboratory will be maintained in Dallas under the direction of William H. Mize.

Miss Motley, Secretary to **Dr. Harvey Wiley,** won the second prize in the dental hygiene educational contest conducted by E. R. Squibb & Sons, in which there were nearly 40,000 contestants. The winner of the first prize was Mrs. Jefferson Jenkins of Tarboro. The latter received $2000, the former $1500. There were numerous prizes of smaller amounts.

OBITUARY.

DANIEL BASE.

Dr. Daniel Base, head of the laboratory and research department of Hynson, Westcott & Dunning, until his serious illness last November, died at the Johns Hopkins Hospital, Baltimore Md., June 17th.



DANIEL BASE.

Daniel Base attended the public schools of Baltimore, graduating from Baltimore City College in 1888, after which he entered the Johns Hopkins University, where he specialized in chemistry. He received the degree of A.B. in 1891, and Ph.D. four years later. Shortly thereafter he became a member of the faculty of the Maryland College of Pharmacy, being associated there with the late Dr. William Simon and the late Dr. Charles Caspari. He remained with the college until after its consolidation with the University of Maryland, succeeding Dr. Caspari as dean. He continued in this capacity until his association in 1920 with Hynson, Westcott & Dunning.

Dr. Base was a member of the Maryland Pharmaceutical Association and joined the AMERICAN PHARMACEUTICAL ASSOCIATION in 1898; he held the secretaryship of the Scientific Section from 1905–1906. He was a high type of man and scientist and held the regard and friendship of students and co-workers. He is survived by his widow and one son.

JOHN WINTHROP BALLARD.

John W. Ballard, pioneer druggist of Davenport, Ia., and member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1871, died at his home June 8th, aged 78 years.

Mr. Ballard contributed a paper for the Des Moines meeting, published in this number of the JOURNAL. He had been in poor health for nearly a year, so that he was unable to attend the latter convention, but exhibited his interest as indicated. He retired from the drug business in 1920; however, with a son, Harry W. Ballard, continued the dental business which was part of Ballard Drug and Dental Company. Mr. Ballard was one of the organizers of the Tri-City Retail Druggists' Association, now the Quad-City Association.

A sketch of the deceased is printed in the April JOURNAL A. PH. A. of 1921, p. 243. He is survived by two daughters and two sons. Funeral services were held June 11th, at Calvary Baptist Church, Davenport.

DR. EMILE COUÉ.

An Associated Press Dispatch from Nancy, France, of July 2, announces the death of Dr. Émile Coué, the famous advocate of auto-

suggestion in the treatment of illnesses.

The *Nancy Republican* states that his death was due to general fatigue brought on by over-work in countless lectures and holding sessions.

Emile Coué was born in Troyes, France, 69 years ago. He studied at the Lycee of Troyes and spent 30 years as a pharmacist in Troyes and served as an intern in a hospital for two years. He never laid claims to being a scientist in a modern sense but was always a strong advocate of auto-suggestion.

It will be remembered that he visited in the United States about three years ago and made many friends. His service was given free and freely, and at his home city many were waiting daily to confer with him.

The greater part of his life was spent in the city of his birth and he had accumulated considerable means. As stated, he did not pretend to be a profound scientist or a philosopher. His distinguishing characteristic was modesty which endeared him to hundreds of thousands of personal followers. In practice his method was simplicity itself, so simple in fact that it was frowned on by the skeptical as childish or even silly. Hardly any one will question that he persuaded many to take up his formula, "Day by day in every way I am getting better and better," who profited thereby. But, after all this is said to the credit of the deceased, as in all things, there is the other side; some persons, perhaps many of those who consulted him, failed to consult the physician. It is rather difficult to absolutely determine on which side the favorable balance obtains because, unquestionably, a great number who came to him should have consulted their physicians.

DR. JOHN HOWLAND.

Dr. John Howland, professor of pediatrics in the Johns Hopkins Medical School, died in London, June 20th, following an operation. He was for a number of years a member of the Council on Pharmacy and Chemistry of the A. M. A. Dr. Howland is best known for his work in establishing successful methods for the cure of rickets.

SOCIETIES AND COLLEGES.

NATIONAL CONFERENCE ON PHARMACEUTICAL RESEARCH.

The fifth annual meeting of the National Conference on Pharmaceutical Research will take place at Hotel Bellevue-Stratford, Philadelphia on Saturday, September 11, 1926, beginning at 9.30 A.M.

The tentative program follows:

1. Roll-call of Delegates
2. Reading of minutes of last meeting
3. Report of Chairman
4. Report of Secretary-Treasurer
5. Reports of the 10 standing committees
6. Report of the special committee on committees
7. Report of the Committee on the Book of Pharmaceutical Achievement
8. Reports and greetings of the delegates from member organizations
9. Discussions:
   - (*a*) Census of Research
   - (*b*) Research Topics
   - (*c*) Research Grants and Prizes
   - (*d*) Research Fellowships and Scholarships
10. Unfinished Business
11. New Business
12. Election of Officers
13. Adjournment

SCIENTIFIC SECTION, A. PH. A.

The annual meeting of THE AMERICAN PHARMACEUTICAL ASSOCIATION will be held at the Hotel Bellevue-Stratford in Philadelphia, during the week of September 13, 1926.

The officers of the ASSOCIATION are planning for the biggest and best convention we have ever had.

The fact that the Sesqui-Centennial Exposition is being held in Philadelphia this year and that most of the railroads are making special excursion rates to the Exposition, together with the fact that Philadelphia is so readily accessible to such a large majority of our members, assures a record attendance.

Likewise, your officers of the **Scientific Section** are laying plans for bigger, better, more instructive and more interesting sessions than we ever have had before.

In order to do this, however, it is necessary that we have your coöperation and assistance. We are *depending upon you* for at least one paper upon any subject coming within the scope of your section.

To be assured a prominent place on the program send the Secretary the title of your paper as soon as possible.

There is no limit as to the length of papers presented but in order that all may have an equal opportunity to read their papers, your attention is called to the following abstract from the "By-Laws."

SECTION IX.

Article III. Ten minutes shall be allowed for the reading of a paper. If the paper is too lengthy to be read in detail within this space of time, it shall be presented in abstract.

Article IV. The maximum time for the presentation of papers may be reduced at any session by a majority vote of the members present.

Article V. Each speaker in the discussion of a paper shall be allowed five minutes, but the total time permitted for the discussion of any one paper shall not exceed ten minutes.

Article VI. The maximum time for the discussion of papers may be reduced at any session by a majority vote of the members present.

Article VII. All papers and reports presented to the Section become the property of the Association and shall be forwarded to the Editor of the JOURNAL immediately following the annual meeting, by the Secretary of the Section.

The above rules will be strictly adhered to, therefore, if your paper is too lengthy to be read in the time allotted, kindly be prepared to present it in abstract.

Owing to the large number of papers to be presented within a limited time, it will be impossible to include illustrated talks in the program of the Scientific Section.

This ruling, however, does not preclude the use of lantern slides *to illustrate a scientific paper*, so long as the paper can be presented within the allotted time.

We realize the fact that it is hard to "get busy" and write your paper before the last horn "blows" but note that

This Year the Horn Is Going to Blow on August 1st. In other words, all titles of papers, and an abstract (not over 250 words) of the same must be in the hands of the Secretary by this date.

Papers received after August 1st cannot be assured a place on the program and presentation can only be permitted as time may allow.

The program must be completed by this date in order to have it included in the JOURNAL the month before the meeting.

The value of our meeting depends as much, and sometimes more, upon the character of the discussions as upon the papers themselves.

We are therefore asking each author this year to help us enhance the value of the discussion by

First, Suggesting someone to lead the discussion of his paper and furnishing this person with a copy of the paper some time before the meeting.

Second, Furnish the Secretary, before August 1st, with an abstract of 250 words or less, of each paper. The Secretary will mimeograph these abstracts and distribute them to the section members in order that they can determine the papers in which they are most interested and come to the section meetings prepared intelligently to discuss them.

NOW "DO YOUR BIT."

1. Select your *Title.*
2. Write your *Paper.*
3. Make a short *Abstract.*
4. Select a *Discussion Leader.*
5. Send Title and Abstract to the SECRETARY before August 1st.

After attending to the above you can come to Philadelphia with "That Grand and Glorious Feeling" that you have done your share towards making *The Scientific Sessions a Big Success* and with the assurance that the officers will express to you their heartfelt appreciation of your valuable assistance.

PAUL S. PITTENGER, *Secretary,*
5250 Market St., Philadelphia.
F. F. BERG, *President,*
17 Columbia Heights,
Brooklyn, N. Y.

AMERICAN PHARMACEUTICAL ASSOCIATION.

The program of the seventy-fourth meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION will be found under "Association Business" of this issue of the JOURNAL. Partial and tentative programs and announcements of the Sections follow:

EDUCATION AND LEGISLATION.

"Recognition of Pharmacy School Credits in Colleges of Arts and Sciences and Graduate

Schools."—A. R. Bliss, Jr., University of Tennessee.

"Pharmacy Taught the Medical Student."—A. R. Bliss, Jr.

"The Present Status of the Various Systems of Weight in English Pharmacy."—William J. Husa, University of Florida.

"Changes in College Curriculum and Legislation."—H. C. Christensen.

"Pharmacy Plus?"—Wortley F. Rudd.

"A Uniform Pharmacy Law."—William Mansfield.

A number of other papers have been promised.

HISTORICAL PHARMACY.

"Tschirch-Master of Pharmacognosy."—Otto Raubenheimer.

"Preliminary Report of the History A. PH. A."—Clyde L. Eddy.

"History of Cascara Industry."—Thurman J. Starker.

"History of the Mint Industry."—C. C. Glover.

"History of Pharmacognosy."—Wm. J. Stoneback.

"Pharmaceutical Events in and about 1776."—Dr. Otto Raubenheimer.

Other papers have been promised; among them, one by Ex-President J. U. Lloyd.

SEND IN YOUR PAPERS.

The names and addresses of section officers will be found on p. X. If it is impossible to send in your papers now, advise the Chairman or Secretary of the Section of the titles, so they may be listed. The time is *Now!*

ROOM TARIFF AT HEADQUARTERS HOTEL—THE BELLEVUE-STRATFORD.

A list and rates of other hotels will be printed in next issue of the JOURNAL. The room tariff at the Bellevue-Stratford follows; make your reservations promptly.

Rooms without Bath—Single room, $4.00, $6.00. (Additional charge of $2.00 for each extra person in room.)

Rooms with bath—Single room inside—$5.00, $6.00. (Additional charge of $2.00 for each extra person in room.)

Single Room and bath with outlook—$7.00, $9.00.

Double room and bath with outlook—$9.00, $11.00.

Room with twin beds and bath (open court)—$8.00, $9.00.

Large double room with twin beds and bath—$10.00, $13.00.

AMERICAN PHARMACEUTICAL MANUFACTURERS' ASSOCIATION.

The American Pharmaceutical Manufacturers' Association held a most successful meeting at Lake Placid Club. President Foy urged closer coöperation of the manufacturers with the AMERICAN PHARMACEUTICAL ASSOCIATION and the National Association of Retail Druggists. Dr. H. V. Arny spoke as delegate from the AMERICAN PHARMACEUTICAL ASSOCIATION and also in behalf of more pharmaceutical research. He brought out the thought that closer coöperation of the colleges of Pharmacy and the manufacturers' laboratories could be brought about, that senior students might serve a cadetship in the latter, gaining experience and some pay toward defraying their expenses at College.

Various problems of manufacture, trade and legislation were reported on by the various committees, and discussed. Dr. A. S. Burdick advocated the curtailment of lines handled and the elimination of all small order business by the manufacturer so as to cut down waste. He deplored "cut-throat competition" and asked the members so to conduct their business as to build for permanency.

Robert L. McNeill reported for the contact committee stressing the work which has been accomplished. J. D. Hoskins reported relative to suggestive changes in assay methods for nitroglycerin tablets. Dr. J. B. Fish's paper set forth the fact that it was difficult to maintain standard weight in tablets, chiefly due to four factors: mechanical, chemical, personal and atmospheric. Dr. Paul S. Pittenger read a paper on the nomenclature of endocrine products. He said there were three essential factors in the production of good products, namely: fresh gland, proper dessication and careful dissection.

The following officers were elected for the ensuing year: *President*, Ralph R. Patch, Stoneham, Mass.; *First Vice-President*, J. A. Tailby, Boston; *Second Vice-President*, F. A. Rostofer, Columbus, Ohio; *Secretary*, John A. Searle, Chicago; *Treasurer*, C. N. Angst, Indianapolis.

INTERNATIONAL CONGRESS OF PLANT SCIENCES.

Primarily, the Congress is intended to bring together a widely representative inter-

national gathering of leaders for the presentation and consideration of fundamental contributions to the research and educational aspects of plant science, or, in brief, all phases of botany, plant chemistry, phytopathology, bacteriology, pharmacognosy and pharmaceutical botany, agronomy, horticulture, and forestry. This is the 4th international congress.

Secretary Heber W. Youngken, of the Section on Pharmacognosy and Pharmaceutical Botany, writes that the program for that Section will be ready for distribution in a few days. The meeting opens August 16. It was hoped that Prof. Dr. A. Tschirch would be present, but the condition of his health will not permit; he will, however, send a written address. The sessions of the Congress will be held at Cornell University. Members of pharmaceutical faculties and investigators are invited; a number of foreign pharmacognosists will present papers.

OFFICERS OF STATE PHARMACEUTICAL ASSOCIATIONS, 1926–1927.

(Secretaries of associations are asked to make corrections and send in list of officers and name of next convention city.)

Other Associations will be reported in next number of the JOURNAL.

ALABAMA.

Selma was selected as the next meeting place by Alabama Pharmaceutical Association. The following officers were elected for the ensuing year:

President, Hal E. Duncan, reëlected.
First Vice-President, Floyd Macon, Mobile.
Second Vice-President, W. S. Dumas, Foley.
Secretary, W. E. Bingham, Tuscaloosa.
Treasurer, S. L. Toomer, Auburn.

President Duncan spoke for a college of Pharmacy at Alabama Polytechnic Institute, and he was endorsed by the convention. Earl E. Pugh was one of the representatives of the AMERICAN PHARMACEUTICAL ASSOCIATION. Samuel C. Davis, of Nashville, represented the N. A. R. D. President Duncan has been named a member of the Committee on Pharmacy Week.

CALIFORNIA.

California Pharmaceutical Association elected the following officers for the ensuing year:

President, V. L. Schaefer, Alameda.
First Vice-President, W. M. Fulton, Long Beach.
Second Vice-President, J. H. Huntoon, Visalia.
Secretary, T. W. Jones, Long Beach.
Treasurer, E. M. Phillips, Los Angeles.

President McColloch stressed the importance of support in behalf of state and national associations. Among the speakers were, S. C. Henry, E. C. Brokmeyer, R. G. Pankow, C. A. Gummere. President von Kleinsmid delivered an address on "Pharmaceutical Education, Yesterday, To-day and To-morrow." John Culley and F. E. Mortenson reported on the progress of the A. PH. A. Headquarters and spoke for further support of the project. The J. H. Beal prize on the subject of "The Pharmacist's Duty to the Public" was won by Misses Sarah R. Hollanbe and Mary Martin—$15.00 going to the former and $10.00 to the latter.

The next annual meeting will be held at Sacramento.

GEORGIA.

Among the speakers at the meeting of the Georgia Pharmaceutical Association were, E. F. Kelly, Secretary of the A. PH. A., Carl Weeks, Joseph Jacobs, Dean R. C. Wilson. The following officers were elected for the ensuing year:

President, A. R. Munn, reëlected.
First Vice-President, Walter D. Jones, Savannah.
Second Vice-President, George Wheat, Columbus.
Third Vice-President, J. C. Ramsey, Louisville.
Secretary-Treasurer, Frederick D. Bridges, Atlanta.

Hearty approval was given to the high standards in pharmacy, both in schools and examinations by boards of pharmacy.

KENTUCKY.

Kentucky Pharmaceutical Association went on record against sale of alcoholic liquors in a drug store. Opposition was expressed by resolution against interference by the Governor in the personnel and functions of the State Board of Pharmacy. The following officers were elected for the ensuing year:

President, Edward A. Hinkebein, Louisville.
First Vice-President, Clay Vallandingham, Owenton.
Second Vice-President, W. J. Poynter, London.

Third Vice-President, A. J. Beeler, Lebanon Junction.

Secretary, J. W. Gayle, Frankfort.

Treasurer, William J. Johnston, Mayfield.

It was voted to petition the State Legislature to enact a law restricting ownership of drug stores to pharmacists and start a campaign to educate the public relative to the service of pharmacy.

LOUISIANA.

The following officers were elected by Louisiana Pharmaceutical Association:

President, John E. Guess, Hammond.

First Vice-President, Sidney J. Peters, New Orleans.

Second Vice-President, Donald K. Mayer, Coninsboro.

Secretary, Geo. W. McDuff, New Orleans.

Treasurer, Adam Wirth, New Orleans.

MISSISSIPPI.

The Mississippi Pharmaceutical Association held its meeting at Jackson, June 8 and 9. Price Maintenance was approved. The following officers were elected for the ensuing year:

President, J. T. Mathis, Leland.

First Vice-President, J. W. Pollard, Jackson.

Second Vice-President, Miss Adel Stigler, Yazoo City.

Secretary-Treasurer, A. S. Coody, Jackson.

MISSOURI.

Among the visitors and delegates at the Missouri Pharmaceutical Association meeting at Kansas City were Deans L. D. Havenhill and Charles F. Mollet, Daniel H. Spencer, W. N. Varnum, William Gates, Secretary of Kansas Association. The following officers for the ensuing year were elected:

President, H. C. Tindall, Excelsior Springs.

First Vice-President, H. M. Whelpley, St. Louis.

Second Vice-President, William Bard, Sedalia.

Third Vice-President, H. C. Jamison, Joplin.

Secretary, W. H. Lamont, St. Louis.

Assistant Secretary, Mrs. Edna Maxwell, St. Joseph.

Treasurer, William Mittelbach, Booneville.

Among the speakers were Alroy S. Phillips, prohibition commissioner, and Judge H. P. Loveland; H. D. Faxon spoke on the relation of the manufacturer, wholesaler and retailer; Dr. H. M. Whelpley gave an historical review of pharmacy in Missouri. An interesting feature was "Brass Tacks Talks," presided over by Fred L. Fricke; much interest was developed in the U. S. P. and N. F. preparation contest; Paul Strahl demonstrated show card writing and drawing. Prof. Gustafson, A. N. Doershur and Mrs. M. M. Whitney, in the order named, won the prizes of the Scientific, Legislative and Commercial sections.

NEBRASKA.

The forty-fifth annual meeting of Nebraska Pharmaceutical Association was held in Omaha, June 8–10. The following officers were elected:

President, O. V. McCracken, Grand Island.

Vice-Presidents, Fred J. Crentz, Wausa; J. Paul Browne, Lincoln; H. P. Knudson, St. Edward; J. A. Porter, Lincoln; H. W. Bauer, Syracuse.

Secretary, J. G. McBride, Lincoln.

Treasurer, D. D. Adams, Nehawka.

Approval was given to the State Department activities in prosecuting violations of the pharmacy law, and the stand taken by the Association on the prohibition law was re-affirmed. The By-Laws of the Association were amended relative to candidates for members of the State Board of Pharmacy, which will require that they shall have been registered for seven years, engaged in retail pharmacy for a like period, members of the State Association for four years and must have attended four annual meetings. The Association will meet in Lincoln next year.

NEW JERSEY.

The New Jersey Pharmaceutical Association convened in the 56th annual session at the Hotel Chelsea, Atlantic City. The following officers were elected:

President, Frank P. Strehl, Paterson.

First Vice-President, Edgar R. Sparks, Burlington.

Second Vice-President, Thomas F. Maroney, Bayonne.

Secretary, Jeannot Hostmann, Hoboken.

Treasurer, Charles J. McCloskey, Jersey City.

President Fried stressed closer coöperation of associations and of committees; he recommended longer annual sessions and, among legislative items, the introduction into the next Legislature of a drug-store ownership bill. E. L. Newcomb was one of the speakers; he discussed price standardization. Many

interesting papers were read; several related to the new Standards—the U. S. P. X and N. F. V.

The publication of the monthly journal will begin January 1. The convention for 1927 will be held at Spring Lake, June 14–17.

TEXAS.

Texas Pharmaceutical Association had a record attendance at the meeting in Dallas, more than 1700 being registered. The following officers were elected for the ensuing year:

President, Zeb. W. Rike, Farmersville.
First Vice-President, Shine Williams, Big Springs.
Second Vice-President, Joe L. Horn, Fort Worth.
Secretary-Treasurer, Walter D. Adams, Forney.
Home Secretary, A. W. Griffith, Austin.
Historian, Chester A. Duncan, Dallas.

President Griffith opposed the sale of liquors in drug stores and received the endorsement of the Association. It is not often that an association receives the fine support of the daily press given the Texas Association; on one day *The Dallas News* gave a whole section of 8 pages to the convention articles and publicity for the pharmacists. The Association also produced its own daily newspaper, the *Evening Capsule*, which was printed each night of the convention. Miss Margaret Cousins was editor and her staff included numerous druggists and drug travelers. Miss Cousins is the daughter of Editor W. H. Cousins of the *Southern Pharmaceutical Journal*. Among the speakers of the convention were W. F. Gidley, University of Texas, School of Pharmacy; Wilford Harrison, Samuel C. Henry. James M. O'Hara, assistant prohibition commissioner, spoke at length and thanked the members for the support given him by them. The drug show was successful in every respect.

The Women's Auxiliary has grown into a very active organization, giving full support to the Association's promotions. Mrs. W. H. Wentland has been appointed field agent of the Auxiliary, to organize branches in various sections of the State. The auxiliary has so far aided eight young women in completing their pharmacy education at the State University; the Association also provides scholarships. The formation of branches of the Association is going forward satisfactorily.

UTAH.

President Frank E. Ulrich of Utah Pharmaceutical Association favors restricted ownership of drug stores, and also that manufacturers and wholesalers of medicines restrict their sales to drug stores. The following officers were elected for the ensuing year:

President, Eugene Karr, Ogden.
First Vice-President, Jacob Johnston, Salt Lake.
Second Vice-President, Clark Watson, St. George.
Secretary, John Culley, Ogden.
Treasurer, Alex Hedquist.

President Ulrich encouraged support of the A. PH. A. Headquarters and recommended that a delegate be sent to the Philadelphia convention. Among the speakers of the meeting were W. Bruce Philip, Samuel C. Henry, Dr. A. L. Beeley and Dr. George Thomas, of the University of Utah.

VIRGINIA.

The Virginia Pharmaceutical Association convened at Bedford, June 15–17. Among the speakers were E. L. Newcomb whose subject was "Price Standardization;" Clyde L. Eddy spoke on "Chain Stores and Modern Merchandising Tendencies." The officers for the ensuing year are:

President, N. G. Miller, Purcelleville.
Vice-Presidents, C. R. Claiborne, Lynchburg; W. E. Locke, Richmond; H. R. Cecil, Dublin; H. S. Falconer, Newport News; G. E. Heller, Bedford; C. W. Powers, Roanoke.
Secretary, A. L. I. Winne, Richmond.
Treasurer, Miss Maude Lambert, Roanoke.

The Association adopted resolutions reëndorsing the principle of Price Standardization and Secretary Winne has mailed a strong letter urging the active support of the members.

The Commercial Section held a profitable session; the program was contributed to by J. B. Clower, C. L. Guthrie, I. F. Truitt, W. E. Locke, J. T. Wallace, L. W. Butler, W. C. Miller, F. W. McIntosh, G. E. Thompson and others.

WEST VIRGINIA PHARMACEUTICAL ASSOCIATION.

The 20th annual meeting of West Virginia Pharmaceutical Association was held at Charleston, June 21–24. President Dent favored price maintenance, opposed selling

liquor in drug stores; he spoke effectively for A. PH. A. Headquarters; favored cultural subjects in pharmacy curricula. He called attention to the new standards, which are now official—the U. S. P. X and N. F. V, and emphasized the need of giving strong support to National and State Associations. Among the speakers of the convention were H. S. Noel, Prof. Gordon A. Bergy, Prof. J. Lester Hayman and W. Russell Green.

WASHINGTON DRUGGISTS MEET.

The District of Columbia Retail Druggists' Association and the Washington Wholesale Drug Exchange members held their annual banquet at Raleigh Hotel, June 8. Among those attending from Baltimore were: Secretary E. F. Kelly, President Samuel Y. Harris of Maryland Association, R. E. L. Williamson and Charles Myers.

After the banquet election of officers was held, resulting in reëlection of all the officers.

Brief addresses were made by the visitors, Frank T. Stone, President of the N. A. R. D., and others.

ILLINOIS PHARMACEUTICAL ASSOCIATION.

The 47th annual meeting of the Illinois Pharmaceutical Association was held at Chicago, June 29th to July 1st, inclusive. The following officers were elected:

President, J. B. Michels, El Paso.

First Vice-President, E. D. Hirschy, Kewanee.

Second Vice-President, John A. Mahaffy, Chicago.

Third Vice-President, Archer T. Davis, Decatur.

Secretary, W. B. Day, Chicago.

Treasurer, George M. Bennett, Urbana.

The meeting was a very successful one with a large attendance and a very interesting program. Among the speakers were: Samuel C. Henry, E. L. Newcomb, Frank Freericks, Jerry McQuade and Douglas Malloch.

MARYLAND PHARMACEUTICAL ASSOCIATION.

The successful campaign for members under the direction of President Harris was referred to in the June number of the JOURNAL. This and the success of the *Maryland Pharmacist* were outstanding accomplishments of the year. Governor Ritchie's attendance during part of two consecutive days and his encouraging addresses found the members responsive with due appreciation. President Harris favored annual registration of pharmacists, support of the Harrison law (except that codeine should be removed from list of narcotics), bringing about closer coöperation with the pharmacists of the District of Columbia.

Resolutions offered by S. L. Hilton were adopted, favoring equal pay for pharmacists in Public Health Service and opposition to H. R. 10,729 and 11,612.

Reference to the report on Procter Memorial will be found elsewhere in this issue. Among the papers were those by Dr. David I. Macht on "Drugs *vs.* Poisons," "Insulin" by Dr. Wyatt Randall; "Ampuls and Ampul Filling" (with demonstration), Dr. S. L. Hilton. Among the speakers were E. L. Newcomb, W. Russell Green and the Governor. The delegates from the AMERICAN PHARMACEUTICAL ASSOCIATION were, R. L. Swain, S. L. Hilton and E. G. Eberle. The following officers were elected for the ensuing year:

President, H. A. B. Dunning, Baltimore.

First Vice-President, H. R. Rudy, Hagerstown.

Second Vice-President, H. W. Allen, Baltimore.

Third Vice-President, George W. Colborn, Princess Anne.

Secretary, E. F. Kelly, Baltimore.

Treasurer, G. P. Hetz, Baltimore.

Editor, R. L. Swain, Baltimore.

Members of the Executive Committee are: C. C. Neal, Baltimore; W. K. Edwards, Cumberland; A. L. Lyons, Havre de Grace; E. L. Meyer and Robert E. Lee Williamson, Baltimore.

MASSACHUSETTS PHARMACEUTICAL ASSOCIATION.

James F. Finneran, Convention Director of Massachusetts Pharmaceutical Association, was presented with a Governor Winthrop desk with chair to match, as an appreciation of his services. In accepting Mr. Finneran said that whatever services he had rendered were given because he loved to give them.

Among the speakers of the convention were E. L. Newcomb, A. Owsley Stanley, former U. S. Senator from Kentucky, Prohibition Administrator George A. Parker. President

Maurice W. Corbin advocated higher standards for pharmacy, the passage of a prerequisite law, disuse of signs advertising "cut rate."

The following officers were elected:

President, William H. Townsend, Lynn.

First Vice-President, Carl G. A. Harring, Dorchester.

Secretary, James F. Guerin, Worcester.

Treasurer, Lyman W. Griffin, Allston.

Trustees of the Permanent Fund, John R. Sawyer, Jamaica Plain; William S. Flint, Worcester; C. Herbert Packard, East Boston.

NORTH CAROLINA PHARMACEUTICAL ASSOCIATION.

The North Carolina Pharmaceutical Association held most of its sessions while journeying by boat to New York. President A. Allison James expressed the hope that pharmacists would be represented in legislative bodies, but advised that plans should be made for reasonable assurance of election. He emphasized the importance of having pharmacists represented in matters that concern public health. His discussion of pharmacy regulations was well presented and informative, he favored a year of practical experience in a pharmacy and three years of college training, he did not favor the "registered assistant" license. President James spoke encouragingly of the A. PH. A. Headquarters project and considered this one of the outstanding achievements of American Pharmacy. Price maintenance was endorsed.

PENNSYLVANIA PHARMACEUTICAL ASSOCIATION.

President Geo. F. Lee in his address dwelt upon the activities and needs of the Association. The outstanding accomplishments of his administration are the organization of three new local associations, the inauguration of the employment service, the establishment of a permanent office with full-time Secretary in Harrisburg, 730 new members enrolled and the edition of two numbers of the *Pennsylvania Pharmacist*. It will now be issued as a monthly publication.

The new full-time Secretary, Joseph G. Noh, who entered upon his new duties at the permanent office in Harrisburg on June 1st, outlined the services to be rendered to the members of the Association as follows:

1. Maintaining and building up the membership.
2. Publishing the monthly journal, bulletins, proceedings, news letters, etc.
3. Organizing against bad legislation.
4. Exchanging plans and ideas for better business.
5. Information bureau.
6. Employment bureau.
7. Organizing local and county associations.
8. Coöperation between the pharmacist and the law.
9. Closer relationship between retailer, wholesaler and manufacturer.
10. Presenting business suggestions and speculative opportunities.
11. Collection of dues.
12. Notary Public.

Resolutions were adopted on "Price Standardization," greater activities in legislative work, on equal pay for pharmacists in U. S. Public Health Service with those of U. S. Navy, opposition to H. R. 10,729, to H. R. 11,612.

A large number of papers were read and discussed. Among the speakers were H. S. Noel, on "Better Merchandising;" Eugene C. Brokmeyer, on legislative matters; E. L. Newcomb on "Price Standardization;" R. G. Hale on "Window Trimming."

The "Gold Prize" of $20 was presented to Mr. and Mrs. J. C. Peacock for their paper on "Tannin of Rhus Glabra."

The following officers were elected:

President, Joseph W. England, Philadelphia.

First Vice-President, George O. Yohe, Pittsburgh.

Second Vice-President, Sterling W. Griesing, Hazleton.

Secretary-Treasurer, Joseph J. Noh, Harrisburg.

Member Executive Committee, George F. Lee, Johnstown.

Local Secretary, Charles W. Coffman, Waynesboro.

Buena Vista Spring Hotel was selected as the meeting place for the celebration of the 50th Anniversary during June 21 to 23, 1927.

AMERICAN PHARMACEUTICAL ASSOCIATION MEMBERSHIP AS PRIZES.

The JOURNAL will be pleased to print the names of students who have been awarded A. PH. A. membership prizes. The Pittsburgh College of Pharmacy reports the following:

The Pharmacognosy prize, Sister M. Dolorosa Boyle, awarded by Prof. L. K. Darbaker.

The Materia Medica prize, Sister M. Mildred Selzer, awarded by Prof. A. F. Judd.

The Pharmacy prize, George H. Wilson, awarded by Prof. Louis Saalbach.

The Chemistry prize, Lewis Sarcinella, awarded by Prof. J. A. Koch.

The Pharmaceutical Products prize, Sister M. Dolorosa Boyle, awarded by Prof. F. J. Blumenschein.

Jacob Weissbuch was awarded a membership by Brooklyn College of Pharmacy.

Cecil R. Veatch, of Harrisburg, Illinois, was given the William Gray membership prize of the University of Illinois, School of Pharmacy.

Catherine Curran, Chicago, Illinois, was awarded the Materia Medica prize, offered by the University of Illinois, School of Pharmacy, given by Dean W. B. Day.

Paul Sang, Chicago, Illinois, was given the chemistry prize offered by Prof. A. H. Clark.

WHITHER?*

"The great and abiding interest I have long had in all the medical arts and sciences prevents me from assuming any false modesty. I look upon the pharmaceutical branch of the medical arts and sciences as one of the most important branches.

"I shall regard any separation of that branch from its vital connection with the great group as a calamity not only to pharmacy but to medicine and the public.

"It is therefore a privilege to speak for unity not only of material interest but of ideals and for the most serious and earnest consideration of these things which are the hope, as well of those things which threaten disaster to us all.

"We must face what is ahead with high purpose as well as the wisdom of experience and not rely wholly on technical knowledge."

"I would be failing in my duty here to-day if I held back from bringing clearly before you those duties of the higher sort—those duties which, if performed, raise pharmacy to a great profession, but if not performed it will sink to the level of a vulgar trade."

"If you think you can play pharmacy without large understanding of its relations to the rest of medicine you will assuredly commit folly; nor can you ignore the vastly intricate social problems that will cross your path whether you wish it or not.

"You will very early learn that there are moral problems in your profession which demand a definite stand on your part—if you drift, it will generally be down and not through. Mark me, I say moral not ethical problems. The moment we drop down from moral to ethical, that moment we become fakes. What is right is that which is in keeping with the eternal fitness of things, in harmony with the vast and vastly intricate plan in which we find ourselves.

"What is 'ethical' is largely the whim of some philosophical fancy long teased out. The profession that steps down from moral grounds to toy with ethics is in need of that lash of scorpions that sooner or later it is going to get."

"Don't forget that pharmacy has done just this thing in the past.

"Don't forget that more than once, and that not always in the dim historic past, has pharmacy played sophisticated ethics until the community rose in its wrath and made hard laws.

"It would have been easier for the whole profession if the narcotic problem had been treated as a moral one by the profession, but as they fell down, there came law and now all must bear the ignominy and annoyance of being under the law.

"There are problems to-day that are in the balance—choose whether they will be met by you as men or whether you, having been found wanting in moral stamina, will be put under law.

"A vast vista of do's and don'ts rushes past me as I think of what you are about to see and be. I am seriously tempted to stop a moment to tell you of some that I know are most real and by which your careers will be in great danger."

"There are problems of public health that have not yet been featured, some of which vitally affect your work. Be, therefore, alert in the whole field. Make one of your hobbies the varied relationships of your profession. Use your special knowledge to help the public solve its health problems."

* Parts of an Address given at the 104th Annual Commencement of the Philadelphia College of Pharmacy and Science, June 1926, by William S. Wadsworth, M.D.

NEW JERSEY COLLEGE OF PHARMACY.

Dr. Ernest Little has been elected Dean of New Jersey College of Pharmacy and Dr.

Lloyd K. Riggs has been named Director of Research. William O. Kuebler was re-elected President and this is the 30th year of his office.

FIFTIETH ANNIVERSARY OF THE COLLEGE OF PHARMACY, UNIVERSITY OF MICHIGAN.

In recognition of the fiftieth anniversary of the establishment of the College of Pharmacy at the University of Michigan plans were perfected for a banquet which was held Saturday evening, June 12th at the new Huron Hills Country Club. In response to invitations sent out to the alumni of the College approximately fifty graduates were present. Dean Edward Kraus was toastmaster and as a tribute to the alumni he reviewed the accomplishments of the many graduates who have made notable records in their chosen profession and also took occasion to cite a number of historical facts concerning the College of Pharmacy. He called attention to the fact that while instruction in pharmacy was first offered in the university in 1868 as a part of the curriculum of the Literary College, it was not until 1876 that Pharmacy was placed upon an independent basis by the establishment of the School of Pharmacy. In 1915, in conformity with the practice recommended by the Carnegie Foundation of the Advancement of Teaching, the title was changed to "College of Pharmacy." The first instruction in pharmacy was introduced by Dr. A. B. Prescott, who became the first dean, serving in that capacity until his death in 1905. He was succeeded by Dr. J. O. Schlotterbeck who was dean until his death in 1917. During a number of years of Dr. Schlotterbeck's term of office he was absent from the University engaged in commercial work. The affairs of the College of Pharmacy during these years were administered very ably by Acting Dean A. B. Stevens, who became Dean in 1917, serving until 1919 when he was succeeded by Dr. Henry Kraemer. Since 1920 the affairs of the College of Pharmacy have been administered by Dean Edward H. Kraus.

NEW YORK COLLEGE OF PHARMACY ASKS FOR HISTORICAL MATERIAL.

Prof. Curt P. Wimmer, on behalf of the Board of Trustees of the New York College of Pharmacy, and in view of the fact that this institution will within a few years celebrate its centenary, is asking for historical material relating to the College—newspapers, clippings, —photographs will be returned after copies thereof have been made, if requested.

SCHOOL OF PHARMACY, MEDICAL COLLEGE OF VIRGINIA.

Dean C. B. Jordan, Purdue University School of Pharmacy, Lafayette, Indiana, delivered the annual address to the Pharmacy Honor Society.

The honor graduates are: Upshur Littleton Arrington, Lowell Alexander Gregory and Carleton Aubrey Pollard, Vernon Atwill Turner. The officers of the Pharmacy Honor Society for 1926–1927 are as follows: Morris Phipps, *President;* William P. Harrison, *Vice-President;* H. B. Haag, *Secretary-Treasurer.*

FRENCH WOMEN PHARMACISTS.

The number of first-year women students at the Paris Faculty of Pharmacy is 77, as against 153 men; in the fourth-year class there are 52 female and 93 male students. The influx of the fair sex has steadily increased since the war, and does not appear to have entailed any special consequences or alterations in the arrangements of the Faculty. At Toulouse, it appears, the library and laboratories have each a male and female side, but at the other faculties no such provision is made.

SOUTH DAKOTA LAW ATTACKED BY MUNICIPAL COURT JUDGE.

Judge W. M. Herbert, of the Municipal Court, in Mitchell, S. D., has handed down an opinion that part of the State law which says that only registered pharmacists may sell patent and proprietary medicines in original packages is unconstitutional.

The case was a test brought by P. Wood, a traveling salesman, who was arrested in Mitchell for selling patent medicines.

In his opinion Judge Herbert said: "If a clerk in a drug store, who is not a registered pharmacist, can sell patent medicines already made up for sale, it seems only reasonable that grocery stores or any other parties or persons, who wish to sell drugs in original packages, may do so."

The Judge sustained a demurrer, filed by the defendant, holding that the State law is class legislation.

Although the law has been on the statute books many years, this is the first time it has been questioned. It is expected that an appeal will be taken.

THE PHARMACIST AND THE LAW.

PROHIBITION LAW DECISIONS.

The following decisions are reported in the *U. S. Daily* of July 3.

In application of 1925 permittee to procure, use and sell on prescription, alcohol, whisky, other distilled spirits and wine, examiner's recommendation, after hearing and finding that permittee had been negligent in complying with law in use of permit, that 1926 permit be withheld for 90 days and that allowance of whisky be reduced for remainder of term, was not confirmed by Prohibition Administrator who held that negligence found was insufficient to deny issuance of permit for 1926. In review in equity, under Sec. 6, National Prohibition Act (Comp. St. Sec. 10138½ c), held, that there was no such wilful violation as would justify revocation of permit under Sec. 9 of the act (Comp. St. Sec. 10138½ dd) and order entered directing issuance of permit with reduced allowance for balance of term.—Schreiber *vs.* Andrews *et al.* (District Court, Western District of Penn.)

Where no evidence was offered, in suit in equity to review Administrator's refusal of permit, as to whether or not record had been sent to commissioner for review as required by Regulations 60, Sec. 1932, court assumed that it had been because Administrator made final finding and notice was served on permittee of revocation, and therefore court finds that there was a final decision in behalf of Commissioner which was subject to review under National Prohibition Act, Sec. 6 (Comp. St. Sec. 10138½ c).—Schreiber *vs.* Andrews. (District Court, Western District of Penn.)

OPIUM ADVISORY COMMISSION.

The Opium Advisory Commission of the League of Nations, which has been holding sessions in Geneva, is having problems of its own to solve, the alleged excessive importation of morphia into the Chinese Republic for hospital purposes as charged by Sir Malcolm Delevingne on the advice of the Chinese Anti-Narcotic Society being the point at issue, and to which the Chinese Minister at Rome, Chau Chin-Chu, took vigorous exception. Declaring that Great Britain was responsible for the introduction of opium into China and that she gained enormously by the opium traffic between her colonies and China, he made the statement that he preferred to fight on the question and declared that China was ready to tear up her treaties with foreign powers. According to cable despatches, the minister went on to say that the tremendous anti-foreign feeling in China, of which the foreign powers seemed to be unaware, was such that any Chinese who to-day did not hate foreigners was a poor Chinese. What would have happened had the discussion been allowed to continue can only be conjectured, for the despatch states that at this point the French representative intervened with a request for an adjournment for tea!

EXPORT OPIUM TRADE FROM INDIA TO CEASE.

A newspaper editorial comments on the discontinuance of export from India of opium, to become effective 1935. "A scheme of restriction by 10 per cent annually has been put into effect covering all exportations excepting those intended for medicinal or scientific use. Indian opium, being poor in morphia content, is, however, impracticable for these uses. The restriction scheme, therefore, means the total extinction of the traffic within ten years.

"The Indian Government has made a considerable sacrifice to clear itself of the charge of perpetuating opium-smoking in other countries, of which China has been the principal victim. Loss of revenue will run to $5,000,000 or $10,000,000 a year, and will have to be made up by the taxpayers. Indian leaders, however, have long been convinced that the sacrifice will be worthwhile, in spite of the reluctance of some other nations to take the same stand.

"Incidentally, suppression of the opium traffic is bound to have an important bearing upon the strained relations between Great Britain and China. Politically conscious Chinese have made the refusal of the British Government to act on the matter a main point in their anti-British agitation, which has had so tremendous an effect on Anglo-Chinese trade."

HARRISON ACT UPHELD.

Certain inmates of the Atlanta Federal Penitentiary lost their first move to test the constitutionality of the Harrison Narcotic Act to-day when Federal Judge Samuel H. Sibley denied a petition for a habeas corpus

writ requiring Warden John W. Snook to produce Dr. Frank Sofge, a Federal prisoner serving time for a narcotic violation.

Judge Sibley also denied a motion for bail for Dr. Sofge pending an appeal to the United States Supreme Court. In denying both the habeas corpus writ and the motion for bail Judge Sibley announced that he was forced to uphold the decision of the Supreme Court in the Doremus case, in which the Harrison Anti-Narcotic Law was held constitutional.

GERMANY BANS PROPYL ALCOHOL USE AS DRUG.

The German Minister of Public Welfare, in response to an inquiry as to the permissibility of the use of propyl and iso-propyl alcohol in the manufacture of pharmaceuticals, has stated that ethyl alcohol is the only alcohol suited for making tinctures and the like, basing his argument on the rules and regulations of the German Pharmacopœia.

He claimed that it is altogether too early to countenance the use of propyl alcohol or iso-propyl alcohol in the place of ethyl alcohol, because its effect on the human organism is not yet thoroughly understood. A distinction must not be made between medicinals used externally and internally in this connection. Restriction of the use of propyl and iso-propyl alcohols for pharmaceutical purposes also applies to their use in the manufacture of cosmetics, for many cosmetics have a more or less medicinal use.—*Oil, Paint and Drug Reporter.*

PRICE MAINTENANCE TO BE CONSIDERED BY COMMITTEE.

A special subcommittee will be appointed next winter to consider price maintenance legislation, according to Representative Parker of New York, chairman of the House committee on interstate commerce. The subcommittee, it was stated, will go over the testimony and briefs presented to the full committee, will receive suggestions from parties interested in the legislation, and make changes that may be deemed necessary to perfect the bill.

BOOK NOTICES AND REVIEWS.

Chemistry and Recent Progress in Medicine. The Dohme lectures for 1924. By Julius Stieglitz, Ph.D., Chairman of the Department of Chemistry in the University of Chicago, $5^3/_4 \times 8^1/_2$, VIII + 62 pages. Bound in cloth stamped in gold $1.50, in paper $0.75. Published for The Johns Hopkins University by The Williams & Wilkins Company, Baltimore.

This volume contains the second series of the Charles E. Dohme Memorial Lecturers. In these lectures, the author has endeavored to bring up-to-date the record of the relation between chemistry and medicine as it is outlined in the "Report on the Future Independence and Progress of Medicine in the Age of Chemistry," prepared by a committee of the American Chemical Society in 1921. That he has done admirably well, all who read the volume must admit.

The subject has been approached from two main points of view, namely: from the standpoint of the materials which have to do with the cure and prevention of diseases and from the point of view of the functional or dynamic side of chemical action.

Beginning with an account of the recent discovery of the advantages of ethylene gas as an anesthetic, the author reviews the more recent advances in the field of chemotherapy and the isolation (partial or complete) of the active principles of the internal secretions and biochemical products (antitoxins, sera and bacterial vaccines). These discussions take up the greater part of the first two lectures. The remaining lecture takes up the matter from the second point of view stated above, namely, the study of the functions of the commonest and simplest materials of the body organism by the experimental methods indicated by the laws of physical chemistry. In this discussion, the author takes up the work of Dr. Howland and his associates on the problem of rickets and tetany, the work on the physico-chemical equilibrium of the blood by Van Slyke, Wu and McLean, the theory of membrane equilibria developed by F. G. Donnan and finally the application of the newer theories of oxidation and reduction to this field of work.

The little volume is both interesting and instructive and deserves to be widely read.—A. G. DuMez.

Chemical Synonyms and Trade Names. Dictionary and Commercial Handbook. By

William Gardner. D. Van Nostrand Company, 8 Warren St., New York City, publishers. Price $8.00.

This dictionary contains approximately 17,000 definitions and cross-references—since the first edition 2700 definitions have been added. Of necessity the definitions are brief and further information must be sought elsewhere. It serves a very useful purpose for pharmacist, chemist, druggist, retailer, wholesaler and manufacturer. Several examples will probably show the value of the dictionary, rather unusual terms having been selected.

"**Abus Ha Heree.** An inferior kind of Asafetida in the Bombay market. It is derived from *Ferula alliacea*.

"**A. B. C. Liniment.** Compound liniment of aconite (Linimentum aconiti compositum B. P. C.).

"**Abisol.** A 40 per cent solution of sodium hydrogen sulphite, $NaHSO_3$. A disinfectant and preservative.

"**Izal.** A distillate from coke residues. It is a proprietary disinfectant.

"**Etard's Reagent.** Anhydrous chromium oxychloride, an oxidizing agent.

"**Salol Camphor.** A mixture of 3 parts of salol and 2 parts of camphor. An antiseptic for boils."

It is difficult to review a dictionary; examples answer the purpose better. It should be stated that many of the terms have British application; however, an unfamiliar term is the one most difficult to find and, hence, there is value in that very fact. Considering that sometimes the finding of a name or definition has considerable value to the searcher it is reasonable to assume that this book will repay the purchaser.

Materia Medica and Therapeutics, including Pharmacy and Pharmacology. By Reynold Webb Wilcox, M.A., M.D., L.L., D.C.L. Eleventh edition. P. Blakiston's Son & Co., Philadelphia. Price $5.00.

Prior editions of this work have been reviewed in these columns. This edition has been revised in accordance with U. S. Pharmacopœia X; because the volume was completed before the appearance of the National Formulary V, the drugs and preparations of that Standard are not discussed. Quite naturally the inclusion would, to that extent, have an added value.

The text is presented in two general divisions —"Materia Medica and Pharmacy" and "Pharmacology and Therapeutics." In the former attention is given to pharmaceutical processes, preparations, dosage and their prescribing. The therapeutic agents are grouped according to the chemical or physiological divisions to which they belong. The classification of the second division is in accordance with the particular physiological system upon which the various agents principally act and each agent is fully considered in relation to its pharmacological action and therapeutic uses. In these presentations an effort has been made to embody the latest views of authorities and, in greater detail, the results in actual practice by the author, who also acknowledges the efficient assistance of Dr. Henry Hubbard Pelton in the revision of this work.

About 25 pages of the book are given over to a classification and description of preparations, prescription-writing and Latin terms more or less frequently employed; also dosage and equivalents in weights and measures. In an appendix the organic drugs are listed according to their natural orders. While the text is based on an alphabetical arrangement of the drugs the index may be consulted for the diseases in which they are employed. Various methods of administration and application are fully described. The organic extracts, antitoxins and vaccines are given consideration, but nothing is said about insulin. Perhaps the latter does not fit in with the general scheme of the work; however, the statement is made in the preface that "this volume offers to the medical student and to the practitioner, it is believed, a very complete presentation of the resources at our command (Materia Medica), how they act (Pharmacology), and, finally, how to employ them (Therapeutics)."

This revision of "Wilcox" is fully up to the standard of excellence which has contributed to the popularity of previous editions.

The Book of Prescriptions. By E. W. Lucas, C.B.E. and H. B. Stevens, O.B.E. Eleventh edition. Pp. +382. Price $4.00. P. Blakiston's Son & Co., 1926.

As stated, this is the eleventh edition of this well- and favorably known book of which 35,000 copies have been printed; all of this speaks for its popularity. The book has been thoroughly revised and is a most useful reference for the prescriptionist as well as practitioner of medicine.

The alphabetical arrangement according to the active constituents serves the doctor best, and with the general index is just as convenient for the pharmacist. While prepared, pri-

marily, for British physicians and pharmacists, it is adaptable by those of the United States.

That the revision is up-to-date is indicated by prescriptions containing more recent remedies, for example: Benzye derivatives, organic silver compounds, insulin, those suggested for colloidal therapy, urea derivatives, organo therapy, etc.

The index of diseases and classified remedies has been thoroughly revised. A table of approximate equivalents in terms of the Imperial and Metric Systems is included; the equivalents of the American systems would have added to that extent to value of the book for this country. As a reference, the *Book of Prescriptions* frequently will be of valuable assistance to the dispenser.

Therapeutics, Materia Medica and Pharmacy. The special therapeutics of diseases and symptoms, the physiological and therapeutical actions of drugs, the modern materia medica, official and practical pharmacy, prescription writing, and antidotal and antagonistic treatment of poisoning. By Samuel O. L. Potter, A.M., M.D. Fourteenth edition, revised by R. J. E. Scott, M.A., B.C.L., M.D. Published by P. Blakiston's Son & Co. About 1000 pp. Price $8.50.

Former editions of this well- and favorably-known work have been reviewed in these columns; it might be sufficient to say that the present revision has brought it up-to-date, because the general plan of former editions has been followed; much new matter has been added, considerable revision and some deletions are noted in Part I—"Materia Medica and Therapeutics," and Part III—"Special Therapeutics." In these sections of the book the pharmacist is interested because of the discussions relative to therapeutic action and value of the Materia Medica, constituents, composition, dosage, uses, etc. The information, though concisely given, covers nearly 500 pages. Part III has about 250 pp.; the arrangement, as in Part I, is alphabetical; the application of remedial agents is carefully considered and about 20 pp. are given to treatment of poisoning, antidotes, antagonists, etc.

Part II has greater interest for pharmacists, being devoted to pharmacy and prescription-writing; pharmaceutical processes, dispensing, prescription practice, problems and methods involved in the latter as well as in pharmaceutical manufacture are well presented. While these chapters are not as comprehensive as those in exclusive treatises on pharmacy, the volume has a value for the pharmacist because it includes the subjects previously mentioned.

Laws and regulations applying to the prescribing and dispensing of narcotics and alcoholics are included; a number of pages are given to Latin in connection with terms frequently used and their application in prescription-writing.

The volume also contains a number of convenient and useful tables of thermometric equivalents, weights, measures, percentage solutions, and doses. In every respect this revision compares favorably with former editions.

Potter's Compend of Materia Medica, Therapeutics and Prescription Writing. Revised by A. D. Bush, B.S., M.D. Ninth Edition, 262 pages. P. Blakiston's Son and Company, Philadelphia. Price $2.00.

The revision conforms with U. S. Pharmacopœia X. The Materia Medica is considered according to the following grouping: Restoratives, agents promoting waste, alteratives, astringents, cerebral depressants, cerebral excitants, motor depressants, motor excitants, antizymotics and antipyretics, specifics, evacuants, topical agents. The Compend concludes with a chapter on Latin and Prescription-Writing. The purpose of the well-known compends is to furnish a concise résumé of the relatively more important data of the subjects under consideration. This volume would have been enhanced in value for those who use it most, if the reviser had included the preparations of the National Formulary V. With that exception this volume meets the purpose indicated by the publisher.

Gould and Pyle Pocket Cyclopedia of Medicine and Surgery. Third edition, revised and edited by R. J. E. Scott, M.A., B.C.L., M.D., New York. Published by P. Blakiston's Son & Co., Philadelphia. Price $2.50; with thumb index, $3.00.

The publisher's announcement states that "This compact Pocket Medical Cyclopedia" was prepared based originally upon the large "Cyclopedia of Medicine," by Drs. Gould and Pyle. This, like the former edition, has been edited by Dr. R. J. E. Scott of New York City, who brings to the revision the results of a wide medical and literary experience. The success of the former printings amply justifies its publication; it has had a large circulation at home and in many parts of the world, so

in its improved form we have confidence that it will continue to meet the same approval.

The general plan of the book remains as before, including the Dose Table which is in accordance with the new United States Pharmacopœia X.

It has been thoroughly revised, much of it has been rewritten, a great many new articles have been incorporated and a few of the old ones omitted, all of which has resulted in an increase of 150 pages.

Special provision has been made for the needs of the reader who looks for immediate information. In the furtherance of this object the number of cross references has been largely increased, so too has the amount of matter in tabular form, therefore will be found much more useful than before.

This is a convenient reference book, useful because of the concise explanations and definitions of diseases and medical terms, giving information that a pharmacist frequently requires. There are many tables, including, as stated, dosage, poisons and antidotes, etc. For the physician this volume has a larger use and the size, about 4 x 6, and being bound in flexible leather make it a convenient pocket reference, even though it has more than 900 pages.

Riedel's Mentor, 1926. 60th edition. Bound in half-calf. 1200 pp. Subscription price, R. M. 20.

Although this is the first revision of *Riedel's Mentor* since 1914, it is the 60th edition; this in itself speaks for the value of this work. It is really an index of pharmaceutical products and medicinal specialties, with concise descriptions of them; in many instances the components are given. Reference numbers refer to the manufacturers of these preparations. In order to condense the voluminous information, abbreviations are made use of, thus giving information relative to dosage, uses, sources, therapeutic effect, appearance, etc.

It is almost safe to say that few preparations, worthy of listing, are omitted, *i. e.*, those having sale in Europe; however, many American products are included. This edition has been revised by Dr. Paul Siedler and Felix Dietze, pharmacist of Goslar. The publishers are Jdra-Verlagsanstalt G. m. b. H., Berlin-Britz.

While the volume is most useful for the drug trade of Europe, it will be found of great value to druggists and pharmacists everywhere.

Eighteen thousand titles, in alphabetical order, indicate the comprehensiveness of the work, and each one of these is accompanied by the descriptions to which reference has been made.

The list of manufacturers appears in double column arrangement of 70 pages. There is also included a brief dictionary of technical and medical terms derived from languages other than German.

Perhaps an example (substance of the description) will explain the method of listing and describing the preparations:

Acetol. Mixture of Alum 3% with 8.5% of Acetic Acid, 88% of water. Flavor—Clove, Peppermint, etc. For tooth-ache.

Acetol. Registered name in Canada for Acetylsalicylic Acid.

This chosen title suggested itself because of the two different products indicated by the same name. The constituents are not always given, but in most instances the description serves the purpose; the claim is not made that the book is a formulary.

Pharmacists having need for references to foreign, particularly German, products will find this a useful index, also wholesalers and manufacturers.

The book is well bound in half-leather, the paper is good and the type clear. The firm "Riedel" is a sufficient guarantee that the work has been carefully prepared.

Chemistry in Industry. Edited by H. E. Howe, Chairman, American Chemical Society Committee on Prize Essays and Editor, *Industrial and Engineering Chemistry.* Published by the Chemical Foundation, Inc., 85 Beaver St., New York. Price $1.00.

The work has been prepared by leaders in their respective lines. The book has 428 pages of 22 chapters, illustrated; the names of subjects and authors will answer the purpose of a review:

"I. Catalysis—A New Factor in Industry," by Elwood Hendrick, Curator, Chandler Chemical Museum, Columbia University. "II. The Chemists' Contributions to Aviation," by C. W. Seibel, Helium Division, Bureau of Mines. "III. Casein—A Waste of One Industry Made the Raw Material of Many Others," by George H. Brother, Operating Manager, Karolith Corporation. "IV. The Chemical Rainbow," by M. L. Crossley, Chief Chemist, Calco Chemical Company. "V. Chemistry and Its Application to the Confectionery Industry," by Stroud Jordan,

Chief Chemist, Henry Heide, Inc. "VI. Earthenware and Porcelain," by Albert V. Bleininger, Chemist, Homer Laughlin China Company. "VII. The Chemistry behind Electric Batteries," by Homer D. Holler, Chemist, Bureau of Standards. "VIII. Electroplating and Electroforming," by W. Blum, Chemist, Bureau of Standards. "IX. Military and Industrial Explosives," by Charles L. Reese, Director of Chemical Engineering, E. I. duPont de Nemours & Co., Inc. "X. Glues and Gelatins," by R. H. Bogue, Author, Chemistry and Technology of Gelatin and Glue. "XI. The Chemistry of Inks," by A. B. Davis, President, The Hilton-Davis Company. "XII. Lubricants," by William F. Parish, President, Parish & Tewksbury, Inc. "XIII, Matches," by Hugo Schapiro, Chief Chemist, The Ohio Match Company. "XIV. Paints, Varnishes, and Colors," by Henry A. Gardner, Director, Scientific Section, Paint and Varnish Manufacturers' Associations of the United States; Institute of Paint and Varnish Research. "XV. Portland Cement—A Chemical Contribution to Modern Construction," by G. A. Rankin, Chemist, Chemical Warfare Service. "XVI. Chemistry, Radio, and Incandescent Lamps," by Mary R. Andrews, Research Chemist, General Electric Company. "XVII. Railroad Chemistry," by Wm. M. Barr, Consulting Chemist, Union Pacific System. "XVIII. Rayon-Man-Made Silk," by M. G. Luft, Technical Director, The Industrial Fibre Co., Inc. "XIX. Chemistry in Refrigeration," by Frederick G. Keyes, Professor of Physico-Chemical Research, Massachusetts Institute of Technology. "XX. Rust-Resisting Metals," by F. M. Becket, Vice-President, Electro Metallurgical Company. "XXI. Soap—Cleanliness through Chemistry," by Martin Hill Ittner, Chief Chemist, Colgate & Company. "XXII. The Relation of Chemistry to Water Supplies," by W. W. Skinner, Assistant Chief, Bureau of Chemistry.

Chemistry in Agriculture. Edited by Joseph S. Chamberlain, Professor of Agricultural and Organic Chemistry in Massachusetts Agricultural College; Advisory Editor, C. A. Browne, Chief, Bureau of Chemistry, U. S. Department of Agriculture. Published by the Chemical Foundation, 85 Beaver St., New York. Price $1.00.

The 16 chapters of the book have been prepared by experts in the respective lines. *The Oil Paint and Drug Reporter* in reviewing this intensely interesting and valuable work, because it deals with so important a subject as food production, states:

"Twenty of the foremost authorities on agricultural chemistry have collaborated on 'Chemistry in Agriculture' to tell their stories of what the chemistry of the soil, the plant, the animal and of the human body itself means in furnishing the food that must sustain your life. In giving the last word on all the fascinating problems of the farmer, these authorities have built a book that is of intense interest to everyone who must necessarily be concerned in the matter of food values, production and supply. Chapters concerning vitamins, nitrogen, nutrition, cereals, sugar, fruit and meat appeal to broad human interest, while every man, woman or child who cares for plants or animals will revel in the chapters treating every phase of farm activity."—The foregoing reviews and notices by E. G. E.

Verlag von Gustav Fischer in Jena, well-known publishers of scientific works, favored us with the following three books for review:

Lehrbuch der Klinischen Diagnostik innerer Krankheiten, mit besonderer Berücksichtigung der Untersuchungsmethoden. Herausgegeben von Prof. Dr. Paul Krause, Geh. Medizinalrat, Director der Med. Univ. Klinik in Münster, 3 te Auflage mit 3 Tafeln und 499 Abbildungen in Text. Lex. 866 pp. Mk. 20.

One of the classic works on this subject. The author and his collaborators have certainly produced a masterwork. In view of the prominent place taken to-day by Clinical Pathology in the diagnosis and treatment of disease, it is necessary that not only the medical student but also the pharmacist, chemist and laboratory worker should become familiar with reliable clinical methods. From the book before us I beg to point out the following:

Urine Analysis, pp. 297 to 358.

Physical-Chemical Analysis of Blood, pp. 390 to 412.

Microscopy of Blood, pp. 412 to 427.

Examination of Puncture Fluids, pp. 446 to 452.

Clinical Bacteriology, pp. 587 to 638.

Analysis of Gastric Contents, pp. 693 to 702.

Each one of these chapters is complete in itself and contains only such methods which are thoroughly reliable. A copious bibliography can be found at the end of each chapter, quite an advantage in a work of this kind.

The Author's Index occupies thirteen double-

column pages and contains a novel feature, namely short biographies of the most noted scientists, a welcome feature to the historically inclined. The Subject Index is very complete, consisting of 41 pages in double columns.

We wish the work the best of success.

Allgemeine Bakteriologie and Sterilisationslehre Für Aertzte und Pharmazeuten. Von Dr. Med. K. Laubenheimer, Privatdozent für Hygiene und Bakteriologie, Univ. Heidelberg. Lex. 220 pp. Mk. 9.

From his lectures on Bacteriology to the medical students and on Sterilization to the pharmaceutical students at the University of Heidelberg, the book before us arose. It consists of the following 3 Parts: I, General Morphology and Biology of Microörganisms, including chapters on Immunity; II, Bacteriology and III, Sterilization.

Each part is carefully prepared and the subdivisions have been handled in an original manner. The book is full of information which usually is not easily accessible, being scattered throughout the literature. The 61 illustrations greatly enhance the value of the work. I must not forget to mention the 5 colored plates containing a total of 27 colored illustrations, real works of art, together with explanations. We can highly recommend this excellent book to pharmacists and laboratory workers.

Die Rezeptsammlung des Scribonius Largus. Eine Kritische Studie von Dr. Phil. Wilhelm Schonack. Octavo 95 pp. Mk. 3.

The Romans captured the Greek, but Greek culture captured the Romans. This is especially true as to Roman medicine. The Greek physicians Asclepiades and Damocrates, as early as 100 B. C. to 26 A. D. tried to make the status of medicine in Rome respectable and the later Greek physicians in Rome, as Menecrates, Soranus and quite especially Galenos exercised still greater influence.

Scribonius Largus was of Roman birth and an adherent to the Pneumatic School of Medicine which taught that health depended on a normal condition of the pneuma or vital spirit and is promoted by its tension, which was estimated by the pulse. Sickness was the result of disorder of the vital spirits. It is said that Scribonius Largus was physician to Emperor Claudius and came with him to Britain in 43 A. D.

Credit belongs to Scribonius Largus for writing the first or most important dispensatory, his "Compositiones Medicorum" (47 A. D.), a medical formulary, a compilation of drugs and prescriptions of his time. The author of the treatise before us, Dr. Wilhelm Schonack, with the usual German thoroughness and endurance goes deeply into this subject and shatters many fallacies. The 3 chapters deal with: The Author, the Work and the Prints.

Students of the History of Pharmacy and Medicine here have a chance to acquire authentic knowledge of old Roman pharmacy and medicine.

The History of a Science is Science itself.—OTTO RAUBENHEIMER, Ph.M.

PUBLICATIONS RECEIVED.

The Proceedings of the 51st Regular Meeting of the National Wholesale Druggists' Association, held at Detroit, Mich., is a book of some 550 pages, containing a complete record of all business meetings of the Convention, committee reports in full, discussion on each and action taken, as well as the personnel of all committees for the current year and membership lists revised to January 1926. Also a list of committees, arranged alphabetically, together with the names and addresses of members of each committee; a geographical list of active members (by States and cities) including the officers of each company, a similar list of associate members and alphabetical list of members, both active and associate. The book is fully indexed.

The foregoing is useful and essential information for the members of the organization. The reports of the committees are carefully prepared and of general interest; all of them reflect credit on the members of the respective committees and most of them may be studied with profit by the members of other drug trade organizations, because in all divisions there are common interests. The thought is applicable to the AMERICAN PHARMACEUTICAL ASSOCIATION which can be made more and more the forum for the discussion of problems in which all the divisions are concerned and may come to an understanding and profit thereby.

Report of the British Association for the Advancement of Science, 1925. The book of nearly 500 pages contains a list of officers, reports of the committees and addresses of the sectional presidents, papers, etc., list of research committees and the subjects under investigation. Prof. Horace Lamb in his presi-

dential address points out the purposes of the organization which is similar to that of the American Association for the Advancement of Science, in which the AMERICAN PHARMACEUTICAL ASSOCIATION is represented—To promote interaction between different branches of science.

Year Book of Pharmacy of the British Pharmaceutical Conference, 1925. The Year Book contains Abstracts relating to Pharmacy, Materia Medica, and Chemistry, which occupy nearly 300 pages. The Editor of the Abstracts is J. O. Braithwaite, Ph.C., and the Honorary General Editor of the volume is C. H. Hampshire, B.Sc., F.I.C., Ph.C. The Divisions are in alphabetical sequence, and the items under each division are also in alphabetical order, closing with "Pharmacopœia Revision Notes" and "Notes and Formulae." As the YEAR BOOK of the AMERICAN PHARMACEUTICAL ASSOCIATION, the abstracts are prepared from articles appearing in pharmaceutical and related publications; the JOURNAL A. PH. A. is credited as the source of quite a number of these abstracts.

The transactions of the British Pharmaceutical Conference are fully reported, together with the papers presented at its sessions. The volume also contains lists of officers, members, branches of the Society, laws relating to pharmacy in Great Britain, scholarships and prizes under supervision of the Society, an index of subjects and of authors.

Report on the Fifth National Congress on the Cultivation of Medicinal Plants. By G. Blaque, Secretary-General de l'office National des Matières Premières pour la Drougerie et la Parfumerie. Pp. 54. Price 10 francs. The report may be obtained from the Ministère du Commerce et de l'Industrie, Paris. The efforts of Dr. Blaque and Prof. Perrot for extending the culture and collection of medicinal plants in France and French colonies have met with success, so that the importation of medicinal plants has been materially reduced. These reports go into the details of plant collection and cultivation, and their value and application. The production of iodine from sea-weeds is described; the report also contains illustrations of plants in the fields, drying and storage houses, etc.

Chaulmoogra et autres Graines utilisables contra la Lèpre. By Prof. Em. Perrot. The report may be obtained from the same source as the preceding; the cost is 15 francs. The first chapter deals with the history of Chaulmoogra and illustrations of the tree; branches and fruit of several varieties are shown and described. The methods employed in preparing the oil, products, etc., are explained.

Culture de la Menthe Franco-Mitcham. By Dr. J. Ripert. This report may also be obtained from the Ministère du Commerce et de L'Industrie. Illustrations of mint-growing are shown and the report is replete with information relative to the culture, production and valuation of the oils in different localities, also tabulation of costs connected therewith.

Relative Toxicity of the Lupine Alkaloids. By James Fitton Couch. A contribution from the Bureau of Animal Industry and reprinted from the *Journal of Agricultural Research.* The results show that the most toxic of the lupine alkaloids is *d*-lupanine; in the order of toxicity sparteine comes next, then lupinine, spathulatine; hydroxylupanine is only one-tenth as toxic as *d*-lupanine. It was found that the minimal lethal dose by subcutaneous injection is nearly twice that by intraperitoneal administration.

An Investigation of the American Wormseed, as Grown in South Dakota. By Prof. Anton Hogstad, Jr. This comprehensive report contains illustrations of the still used for the production of the oils, six tinted photomicrographs, showing localization of the oils in the glandular hairs, changes involved in the development of the glandular hairs and a corresponding formation of the essentail oil; the other illustrations represent continued studies up to the fully developed glandular hairs filled with the essential oil.

The investigations presented are most interesting and comprehensive. Among the conclusions reached by Prof. Hogstad are that the essential oil serves as a protection by lowering of transpiration and also as an attraction to insects for pollination purposes. Further investigation is necessary to confirm the importance of ascaridol as standard. Yields of oil and content, of different years, are reported on.

"It is true that these economic things are not the objective of life itself. If by their steady improvement we shall yet further reduce poverty, shall create and secure more happy homes, we shall have served under God to make better men and women."—SECRETARY HOOVER.

Sir William S. Glyn Jones for years Secretary of the Pharmaceutical Society of Great Britain, known for his success in establishing uniform prices in Great Britain and now engaged in similar work in Canada, will speak at the opening session of the AMERICAN PHARMACEUTICAL ASSOCIATION on Tuesday night, September 14th. You should hear him.

LIBERAL REDUCED FARES TO PHILADELPHIA FROM ALL POINTS ON ACCOUNT OF SESQUI-CENTENNIAL CELEBRATION AVAILABLE FOR THOSE WHO ATTEND THE AMERICAN PHARMACEUTICAL ASSOCIATION, THE NATIONAL ASSOCIATION OF BOARDS OF PHARMACY, THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY, THE NATIONAL ASSOCIATION OF RETAIL DRUGGISTS.

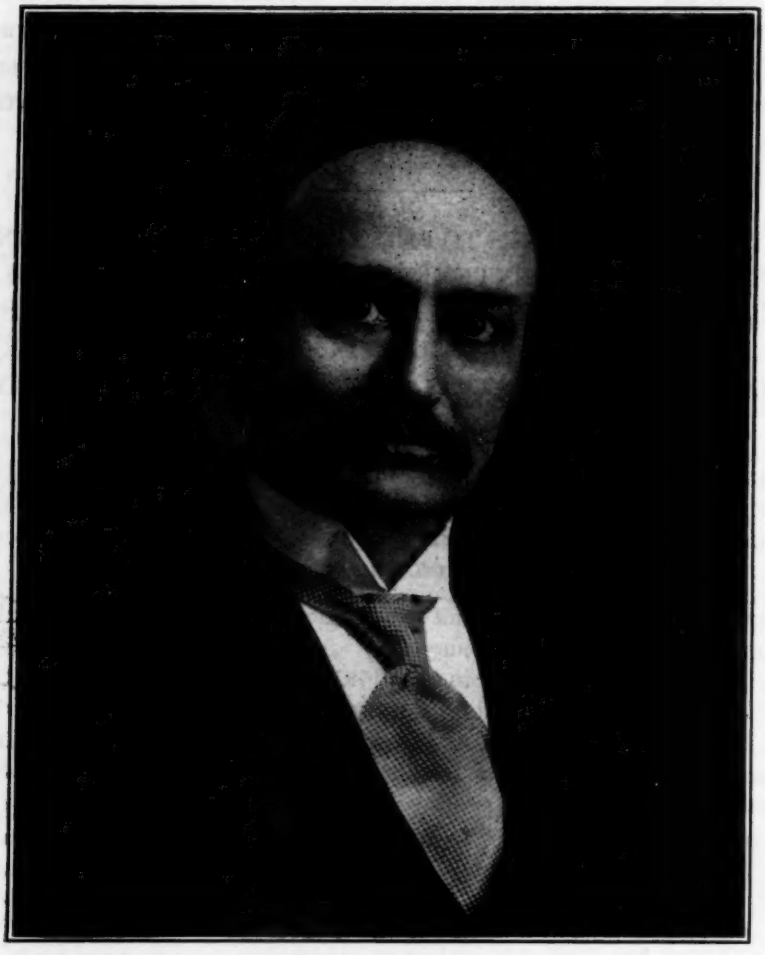
THE AMERICAN PHARMACEUTICAL ASSOCIATION, THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY, AND THE NATIONAL ASSOCIATION OF BOARDS OF PHARMACY MEET DURING THE WEEK OF SEPTEMBER 13. THE NATIONAL ASSOCIATION OF RETAIL DRUGGISTS DURING THE WEEK FOLLOWING.

A special rate based on one and one-half fare has been arranged for all points, tickets good for not less than ten days.

From points 150 miles or more from Philadelphia special excursion tickets will be sold daily, May 29 to November 30, at reduced fares, in some instances less than one and half fare to Philadelphia and return. These tickets, good in Pullman cars as well as coaches, limit in no case less than ten days, *will be increased as the distance increases.*

Passengers from the West, Northwest and Southwest, may at their own option travel via Washington without additional charge, thereby including a visit to the National Capital.

VISITORS TO THE AMERICAN PHARMACEUTICAL ASSOCIATION AND THE SESQUI-CENTENNIAL SHOULD MAKE THEIR PLANS IN ADVANCE, AND CONSULT NEAREST PASSENGER REPRESENTATIVE OR TICKET AGENT.



W. H. ROGERS.

Member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1869
Chairman of the Council, A. PH. A., 1887–1888